

DESIGNING EFFECTIVE CROSS-FUNCTIONAL TEAMS

By

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Although marketing managers are involved in a variety of cross-functional teams, little is known about the factors that influence the effectiveness of these teams. In this dissertation, the author proposed a framework of cross-functional team effectiveness, focusing on factors that are under the direct control of managers designing teams. Relevant research on group effectiveness, horizontal structures, and group motivation theories served as the basis for the framework. This framework proposed that three categories of design factors--team composition, task characteristics, and reward structures--affect three team processes (effort, task interaction, and conflict),

performance and team cohesiveness. Specific facets of each of the design factors were identified, and research propositions for the effects of each of these facets on the three team processes were developed.

These research propositions were then tested in two empirical studies. The first study was a quasi-experiment, using teams of MBA students playing MARKSTRAT, a marketing strategy game. Results from this study indicated that team size, functional diversity, task interdependence, and duality of resources affect team processes. Specifically, team size hindered effort, functional diversity encouraged task interaction, task interdependence helped effort and task interaction, and duality of resources hurt task interaction.

The second study was a survey of actual cross-functional teams in three companies. Members and supervisors of 15 cross-functional teams completed a mail questionnaire concerning their team. This study provided insights into the effects of design factors on team processes. For the team composition effects, skill diversity and diversity in orientations were found to lead to increased effort and task interaction. For the task characteristic effects, task interdependence was found to encourage effort and task interaction, while task ambiguity discouraged both. Task difficulty helped task interaction

discouraged both. Task difficulty helped task interaction and effort was highest at moderate levels of difficulty. Finally, for the reward structure effects, results indicated that organizational support for the team helped effort and task interaction and that, as the proportion of individual over team rewards increased within a team, both effort and task interaction decreased.

CHAPTER 1 INTRODUCTION

Cross-functional teams are often used by companies when performance objectives require cooperation between key functional departments. However, these teams can fail to meet these performance objectives. The business press reports both impressive success and failure stories based on the use of cross-functional teams. At this point, little is known that can help explain these differences in performance. Specifically, there has been little research so far to help companies in the implementation of cross-functional teams. This dissertation fills this gap by focusing on the design of effective cross-functional teams.

The first section of this chapter investigates the importance of cross-functional team effectiveness in marketing. In the second section, the specific objectives of this dissertation are detailed. Finally, the outline of the dissertation is presented.

Importance of Topic in Marketing

A number of factors in the marketing literature indicate that marketing managers are likely to be involved in cross-functional teams. First, coordination between functional areas is stressed as a source of strategic advantage in a variety of areas. Second, marketing managers are one of the key interfaces in each of these areas. Third, the problems encountered in the relationships between marketing and other functional areas are typical of unstructured relationships and have pointed to the development of horizontal structures to achieve coordination. Finally, although a variety of structures can be identified, cross-functional teams appear to be one of the most commonly used. Each of these factors will be reviewed in detail in the following sections.

Cross-Functional Coordination as a Source of Strategic Advantage

Firms are increasingly stressing cross-functional coordination as a source of strategic advantage. Three areas of management illustrate this concern: quality, time, and relationship management.

Management of quality. Quality is increasingly recognized as a key to competitive advantage in the

marketplace. A number of management techniques have been developed to help companies attain quality in their products and processes. For instance, many companies have implemented total quality management programs (Business Week 1992) aimed at introducing a quality focus in every part of the organization. Similarly, most companies involved in international business are in the process of obtaining ISO certification for their products (World Trade 1994). In the new product development area, techniques such as Quality Function Deployment are also gaining momentum (Griffin and Hauser 1992a, 1992b, 1993). All these techniques stress that quality is obtained by focusing on management processes and not solely on outcomes. Among the processes of interest is the notion of cross-functional cooperation. Thus, the success of these efforts at obtaining greater quality in companies seems to depend on successful cooperation between the different functional areas involved.

Time management. The effective management of time also appears as an important motive for cross-functional integration. Peters (1992) stresses the management of time as a source of competitive advantage: one way to develop more efficient business is to reduce the time lags necessary to make decisions, produce and deliver products, develop new products, etc. A similar point is made by

Urban and Hauser (1992) for the development of new products. These authors (Urban and Hauser 1992, Peters 1992) suggest that cross-functional cooperation is key to the successful implementation of time management. Examples of just-in-time management in distribution or logistics also stress cross-functional integration as a key to success (Dear 1988, Japan Management Association 1989) in this area.

Relationship management. Competitiveness is increasingly perceived to be a function of a firm's success at managing a complex web of relationships between customers, suppliers, and other organizations. This view of organizations as an open network is gaining rapid acceptance, helped by the development of interactive technologies and the globalization of the economy. One of the consequences of this relationship perspective is that it blurs the boundaries between internal and external entities. Customers, employees, suppliers, and competitors all are part of a single network and their roles are not as strictly defined as they were in the past. The main focus is on developing better--long-term--relationships between the different entities involved. As a consequence, this approach also implies a greater degree of cross-functional coordination.

Importance of Marketing in these Coordination Efforts

Interestingly, marketing managers are not only likely to be included in these coordination efforts, but in many cases they are leading these efforts. In fact, marketing plays a crucial role in each of these coordination examples. All three domains involve improving firms ability to satisfy customer needs and marketing is the functional area that spans the boundary between the firm and its customers. This boundary nature of the marketing function has been stressed by a number of researchers (e.g., Kotler 1988, Ruekert and Walker 1987). Lysonski (1985) for instance stresses that product managers' function by definition entails an interface between the firm and its environment, as well as between the departments within a firm.

Management of quality. The quality movement is centered around the notion that quality is defined from the customer's perspective. Thus, offering quality products or services consists of meeting customer needs. Because marketing is the functional area constantly in contact and surveying customer needs, marketing is at the core of the quality movement and informs the other functional areas of the customer's perspective. This role is illustrated in

Quality Function Deployment, where marketing plays a key role (Griffin and Hauser 1992a, 1992b, 1993).

Time management. Marketing is also central to the time management movement. Because marketing is the functional area managing the interface at both ends of the firm's processes (suppliers and buyers), it is the functional area that is the most likely to implement time reductions at both these ends. In new product development for instance, Urban and Hauser (1992) emphasize that coordination between engineering and marketing functions is a requirement for successful product development. This coordination appears particularly important for reducing the time necessary to market a product (Urban and Hauser 1993). In a qualitative study of new product development, Dougherty (1987) corroborates this point. She observes that the only enactment pattern followed by product success is one where cooperation between the different functional areas involved starts early in the product development process.

Relationship management. Recent research in marketing indicates the importance given to the relationship metaphor. Gummesson (1987) for instance proposes to redefine marketing as relationship management and explicitly considers in his framework the interfunctional dependencies inherent to the marketing function. Similarly,

using a blend of behavioral decision theory (Cyert and March 1963) and resource-dependence theory (Pfeffer and Salancik 1978), Anderson (1982) views organizational life as a bargaining process among different coalitions (usually functional areas) for the allocation of resources within the company. In his perspective, to stand any chance of diffusing their strategy successfully, marketing managers need to understand the unique orientations of the other coalitions (functional areas) in the firm and have to be able to communicate with these areas on their own terms.

In a similar vein, Wind and Robertson (1983) perceive the interdisciplinary isolation of marketing as one of the main problems facing the successful implementation of marketing strategy. They emphasize that the necessary links between marketing and the other functional areas have been underestimated and underresearched. In this sense, they expand on a paper by Wind (1981), who emphasizes the interdependencies of marketing with most other business functions in a company (finance, accounting, production, customer service, logistics, research and development, personnel, legal departments, public relations, top management).

Conclusion. Because of its boundary nature, marketing plays an important role in many efforts at increasing cross-functional coordination within firms. Indeed, this

role is well-known for the interface with external entities: both the buying and the selling process are generally realized by cross-functional groups (Smith and Barclay 1993, Webster and Wind 1972) More recently however, the role of marketing in internal coordination efforts has been reflected by the growing interest in the notion of market orientation. Market orientation consists of implementing the marketing concept within the entire organization. This implementation, which appears to be the responsibility of the marketing function, implies that marketing managers become actively involved in coordination efforts across the firm (Deshpande and Webster 1989, Kohli and Jaworski 1990).

Relationships Between Marketing and Other Functional Areas

Although stressing coordination efforts between marketing and other functional areas is relatively new, there is a good amount of research describing factors influencing the relationships between marketers and their main interlocutors within companies. Because of the interest in innovation and quality as key competitive advantages, most of this research has concentrated on the relationships between marketing and research and development (R&D) departments. Most of this research has

focused on identifying the problems occurring in the relationships between departments.

Seiler (1963a, 1963b) suggests two sources of problems in cross-functional relationships: conflicts of ideas or values and authority conflicts. Individual energies are diverted from the task when individual points of view differ or when authority is inconsistent with prestige (Seiler 1963a, 1963b). This theory identifies two sources of potential problems in cross-functional relationships, the individuals in the relationship and the organizational structure. Another source of problems is due to the nature of the interaction process.

Individual value problems. Problems due to individuals arise from differences in perspectives or values on key issues. Different time perspectives--e.g., short-term for sales and production versus long-term for R&D (Gupta et al. 1986, Lawrence and Lorsch 1967, Lorsch and Lawrence 1965, Monteleone 1976)--different orientations toward others--e.g., permissive for R&D and sales versus directive for production--and different goal orientations--e.g., science for R&D, market for sales, and plant for production (Lawrence and Lorsch 1967, Lorsch and Lawrence 1965)--have been identified as major sources of misunderstandings between different functional areas. Gupta et al. (1986) add the following personality factors

as important barriers to integration between two departments: bureaucratic (marketing) versus professional (R&D) orientation, tolerance for ambiguity--R&D managers like objective facts while marketers are comfortable with judgmental data--and types of products/projects preferred--marketing prefers sure commercial successes, R&D technical breakthroughs. These value differences are exemplified in Workman's (1993) in-depth study of an R&D department in the computer industry. The insights gained from this case analysis confirm the existence of different time perspectives among the various groups and also suggest that different groups use different units of analysis as reference: strategic portfolio for marketing and products for engineering.

Organizational problems. Organizational problems can occur when top management lets an imbalance of power and prestige develop between the different functions (Souder 1980), or does not clearly encourage the development of cooperative behavior between the groups (Gupta et al. 1986). Allowing differentials in the decision-making prerogatives of the departments or letting them have completely separate budgets and operations is likely to generate difficulties (Souder 1981). Gupta et al. (1986) identify some company-level structural factors as antecedents to potential problems to integration. They

propose that the organization's degree of formalization and of concentration of power have a negative relationship to integration and that the degree of employee participation in new product decisions has a positive relationship to integration between R&D and marketing. The role of senior management is also suggested as a potential problem. In particular, the conveyance from management that collaboration is valued within the organization and an organizational culture highlighting risk and new ideas favor the integration between marketing and R&D (Gupta et al. 1986, Gupta and Wilemon 1988). A good indicator of the willingness to encourage collaboration is to have a joint reward system (Gupta et al. 1986, Lawrence and Lorsch 1967, Souder 1980, 1981).

Interaction problems. These problems mainly concern communication issues and ways to handle conflicts. Lack of communication is one of the milder problems identified by Souder (1980, 1981, 1988) in his study of marketing and R&D relationships. Such problems have also been identified in the relationships between advertising and sales departments (Dubinsky, Barry, and Kerin 1981), between account managers and creative people in advertising agencies (Vanden Bergh, Smith, and Wicks 1986), and between advertising agencies and their clients (Hotz, Ryans, and Shanklin 1982). Communication problems can stem from various sources.

Relationships can degenerate in personality conflicts when the members of one department distrust the members of the others because the different individuals do not understand their counterparts' perspectives (Souder 1980) or have stereotyped views of the other (Lawrence and Lorsch 1967, Gupta et al. 1986). Both Gupta and Wilemon (1988) and Moenaert and Souder (1990a) identify credibility as an issue in the relationships between marketing and R&D. Problems are likely to occur because R&D employees do not trust the subjective data preferred by marketing (Gupta and Wilemon 1988) or do not see the relevance of the information received for their own work (Moenaert and Souder 1990a). A potential solution to this problem is to engage marketing managers with a technical background, who can speak the same language as the R&D employees (Gupta and Wilemon 1988, Moenaert and Souder 1990a).

Conflict handling approaches are the second source of interaction problems. Souder (1980, 1988) mentions the possibility of "too-good" relationships as a potential source of problems, because individuals in such a situation tend to avoid challenging one another. Lawrence and Lorsch (1967) also recommend adopting a problem-solving (confrontational) approach rather than an avoidance approach of conflict resolution in order to avoid these problems.

Conclusion. An important limitation of this stream of research must be mentioned. To identify possible sources of problems between the functional areas, researchers have either based their insights on interviews with managers (Gupta and Wilemon 1988, Mansfield and Wagner 1975, Monteleone 1976, Seiler 1963a, 1963b, Souder 1980, 1981) or on previous literature (Griffin and Hauser 1992a, Moenaert and Souder 1990a, 1990b). Thus, in all cases, this approach relies on managers' insights and reports of the process. This raises the potential problem of the validity of insights gained through retrospective interviews. When they respond, managers know whether they have been successful or not, which can bias their answers. Monteleone (1976) for instance points out that marketers and researchers have a harder time learning to take the blame for their failures than to take credit for their successes. Such a bias could easily distort the self-report answers obtained in most of the research in this area. Unsuccessful managers would tend to attribute their failures more to others than to themselves (typical attributional bias, cf. Weiner 1986) and thus to view the relationships between their department and the other department(s) negatively, while successful managers would be more likely to attribute their successes to the notion that things are getting done the right way. Thus, the

notion that the nature of cross-functional interactions has any direct effect on actual performance, as implied in this research, needs to be considered with some caution.

Beyond this limitation however, the main implication of this research is that cross-functional relationships are prone to many problems and that many of these problems seem linked to the structure of the relationship. In fact, this research indicates that an existing structure with clear decision-making hierarchy and distribution of tasks makes collaboration between functional areas easier (Souder 1980). Thus, this research suggests the need for firms to establish horizontal structures (formal organizations cutting across departments) in order to achieve coordination.

Horizontal Structures to Achieve Coordination

The literature reviewed so far suggests a few critical conclusions. Marketers seem likely to be involved in many different types of horizontal relationships and in a variety of domains. Although marketing researchers agree on the need for collaboration between marketing and other functional areas, each researcher proposes a different solution. Thus, there does not seem to be a single way to reach this much-wanted coordination. Some researchers

emphasize tools that can encourage integration (e.g., Anderson's 1982 portfolio analysis), others focus on organizational design solutions (e.g., Hutt and Speh's 1984 strategy centers). Even researchers stressing organizational design solutions--the focus of this dissertation--propose a wide variety of solutions.

In fact, many different forms of horizontal structures exist. Kohli and Jaworski (1990) for instance propose a number of ways by which firms can encourage cross-functional cooperation (e.g., through inexpensive ways such as informal interdepartmental lunches or through more expensive ways such as exchange of employees across departments). In general, researchers agree that formal horizontal structures evolve from the simplest forms (task forces) to the more complex ones (pure matrix organization). For the simpler stages of evolution, Galbraith (1973) distinguishes between task forces (groups formed specifically for a particular task and that disband once the task is completed) and special teams (groups attending to regularly recurring problems). Kolodny (1979, 1983) proposes that organizations evolve through four different stages over time: function organization, project organization, product/matrix organization, and matrix organization. Although the distinctions between the last two categories appear fuzzy, clear differences can be made

between project organization and matrix organization. Project organization corresponds to a situation where decision-making is decentralized at the level of the project manager for time-bound projects. Because these projects do not have sufficient scale to be autonomous, product managers have to share resources with functional areas (Kolodny 1983). In contrast, matrix organization corresponds to a situation where task activities are permanent and autonomous, and multiple team membership is the rule. The most flexible of all, this organizational form also appears difficult to manage (Kolodny 1983). The distinction between these two forms is similar to one made by Morton (1983) between strong matrix organization (where the project manager has authority over all people in team and legitimate power of reward and punishment) and weak matrix organization (where team members, chosen from functional departments, return to their departments once the project is completed and where the project manager only has monitoring authority).

Cross-Functional Teams

A common characteristic of these horizontal structures is that they all imply the use of cross-functional teams. In fact, cross-functional teams appear as one of the most

frequently used mechanisms for improving coordination between functional areas. Cross-functional teams are defined as teams constituted of individuals from different functional areas brought together to accomplish a given task (or set of tasks).

Many examples of cross-functional teams including the marketing function can be given. Teams generally including marketing, research & development, and production are often used in new product development (e.g., Ancona and Caldwell 1991). In industrial buying and selling, firms rely on buying centers (Anderson and Chambers 1985, Webster and Wind 1972) and selling teams (Hutt, Johnston, and Ronchetto 1985, Smith and Barclay 1993, Spekman and Johnston 1986), both of which include marketing and other functional areas. Cross-functional teams are also created to implement integrated communications--synergistic communications between advertising, promotion, sales, and distribution (Schultz 1993). These teams are internal to the marketing function and include different subfunctions of marketing.

This focus on teams has an important consequence. It prompts researchers to recognize that the relevant level of analysis is the group and not the individual. Thus, some researchers in industrial buying have focused on interaction patterns within the buying center (Johnston and Bonoma

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1981), others on group decision-making procedures (Wilson, Lilien and Wilson 1991), and still others have suggested the importance of looking at group rewards in addition to individual rewards (Anderson and Chambers 1985).

Similarly, in the industrial selling literature, Smith and Barclay (1993) have proposed a comprehensive framework of selling team effectiveness. These efforts appear as a first step towards understanding factors that lead to effective cross-functional teams.

Research Objectives

Although there seems to be a consensus in the literature that cross-functional teams are at the foundation of the success of many of today's business practices in which marketing managers are involved, there are few guidelines offered on how to actually implement these teams. The objective of this project is to offer insights into factors that influence cross-functional team effectiveness and suggest approaches for increasing the effectiveness of these teams.)

Although some research on team effectiveness has been conducted by marketing researchers, the dominant focus has been on studying and describing interpersonal processes and their effect on team performance. Managerially

controllable factors affecting performance have not been examined. For example, Pinto and Pinto (1990) studied the effects of different interaction patterns on cross-functional team effectiveness. Similarly, Johnston and Bonoma (1981) focused on interaction patterns in buying centers. Other researchers have studied decision-making processes in teams (e.g., Wilson, Lilien, and Wilson 1991 in the buying center). Even though this research helps us to understand how teams operate and some of the processes that lead to successful teams, its practical implications remain limited because managers typically have little influence on the interaction patterns within a team. The normative implications drawn from this research are at best indirect (e.g., development of training programs tailored for improving team processes) and have rarely been the focus of the research. Thus, the existing marketing literature on team performance provides little help to managers because it does not point to actions they could undertake to make their teams more effective. Hackman (1987) urges researchers to focus their models of team effectiveness on design factors (or inputs) rather than processes. Through this focus on design factors, researchers can identify factors that are directly under the influence of the manager responsible for the team.

The purpose of this dissertation is to propose a framework of cross-functional team effectiveness that yields direct recommendations for team managers. Following Hackman's (1987) advice, the proposed framework focuses on design factors, i.e., on those factors that a team manager can change easily and that affect team processes and outcomes. Based on interviews with managers involved in cross-functional teams and on the descriptive literature on given types of cross-functional teams (such as project management teams, new venture teams, etc.), three classes of inputs appear critical for cross-functional team performance.

Team composition. First, team composition appears to be an important notion. On one hand, diversity of membership might generate conflicts, misunderstandings, and miscommunication (Ancona and Caldwell 1991; Pinto and Pinto 1990). Team members can belong to different thoughtworlds, with assumptions, values, and languages so different that they cannot understand one another (Dougherty 1987). On the other hand, diversity of skills is the reason to put together the team in the first place. Thus, diversity appears both as a potential asset and as a liability for cross-functional teams. For team managers, the issue is to take advantage of the potential benefits of team diversity and limit the negative effects. Thus, determining the mix

of skills necessary for an effective cross-functional team is a priority. Dealing with this issue encompasses answering questions such as how many people should be in the team? Which dimensions of diversity create problems, which dimensions provide benefits?

Task characteristics. The second set of design factors concerns the characteristics of the tasks the team is asked to accomplish. Teams are typically asked to accomplish complex tasks, that is, tasks that are both difficult and require high levels of coordination between team members. Finding the right balance in complexity so that team members are both able and motivated to work for the team appears an important priority. Depending on the nature of that task, team managers also have to decide on the amount of guidance they should provide the team. Thus, handling task characteristics assumes answers to questions such as the following: How difficult can the task be? What is the best process to integrate individual inputs within the team? How clear should team goals and roles within the team be?

Reward structures. The third set of issues concerns the implementation of reward structures in cross-functional teams. Cross-functional teams usually coexist with traditional functional structures. Indeed, members of cross-functional teams are often assigned simultaneously to

a team and to a functional department. These dual assignments create tensions both within the team and in the relationships with the rest of the organization and raise issues for the reward structure (Butler 1983). They make it difficult to find a balance between team-related and non-team related rewards such that individuals assigned to a team are motivated to work for that team, but also fulfill their other responsibilities. In addition, it is necessary to find an appropriate mix of individual and team rewards based on performance within the team. Thus, dealing with reward structures includes consideration of the following questions: What combination of rewards should be given to motivate team members to work for the team? Within the team itself, what combination of team and individual rewards leads to the best performance?

It is important to note that this dissertation applies best to environments where cross-functional teams are beginning to be used. Thus, the focus of this dissertation is on companies that have traditionally had a functional structure and are now attempting to develop cross-functional teams in addition to the traditional organization. The focus will thus be on companies where the two types of structures coexist, rather than companies that exclusively use cross-functional teams (e.g.,

advertising agencies or professional consulting companies such as McKinsey as reported by Peters 1992).

Outline of Dissertation

The objective of this introductory chapter (Chapter 1) was to introduce the topic investigated in this dissertation and to argue for the importance of this topic in the marketing literature.

In Chapter 2, the relevant literature is reviewed. Three sets of literature appear particularly relevant for the purpose of this dissertation. First, there is a set of empirical research on organizational structures that share many characteristics with cross-functional teams (e.g., project management). The insights gained from this literature are reviewed first. Second, researchers in organization behavior have developed frameworks that help understand team effectiveness and team design. Finally, social psychologists have developed theories for small group motivation and performance that can usefully be applied in a team context.

In Chapter 3, the insights gained from this literature review are used to develop a general framework of cross-functional team performance. This framework allows one to

develop testable research propositions pertaining to the effectiveness of cross-functional teams in general.

To test the overall framework, a two-pronged approach was retained. First, the framework was tested in a controlled environment with teams of MBA students playing a simulation game. The methodology used for this quasi-experiment is detailed in Chapter 4 and the results presented and discussed in Chapter 5. Second, the framework was tested with existing cross-functional teams in industry. The methodology used for this survey is described in Chapter 6 while Chapter 7 presents the analysis of the results. Finally, Chapter 8 summarizes the contributions and limitations of this dissertation and suggests some of the areas in which this project could be extended in the future.

In summary, the main purpose of this paper is to propose a framework to investigate the conditions under which cross-functional teams can be designed to be more effective. Based on the literature on team effectiveness and team design, this project focuses on issues that are inherent to cross-functional teams. The three main areas of team design studied are team composition, task characteristics, and reward structures. To understand the effects of these factors, a theoretical framework is proposed. This framework is tested empirically through a

simulation game played by MBA students and through a survey administered in cross-functional teams in industry.

CHAPTER 2 LITERATURE REVIEW

This chapter reviews three research areas related to the design of effective cross-functional teams. First, researchers in management have developed frameworks for understanding team effectiveness and team design. These frameworks have not been developed specifically for cross-functional teams, so they generally do not incorporate the unique aspects of cross-functional teams, but they provide a good background for understanding factors affecting team effectiveness. Second, there is some empirical literature about some horizontal structures that are special cases of cross-functional teams. Although most of this literature is descriptive, it provides insights into the problems facing managers setting up a cross-functional team. Finally, experimental studies in social psychology investigating group motivation are related to cross-functional team effectiveness.

Team Effectiveness

Researchers in management have developed a number of frameworks for understanding team effectiveness. Typically, researchers have developed input-process-output models of team effectiveness (e.g., Gladstein 1984). These models start with group inputs, usually broken down by level of analysis: individual-level, team-level, and environmental. These inputs influence a number of processes, which are usually the focus of the frameworks: communication, conflict, exchange of information, collaboration. Finally, these processes lead to some team outputs, usually performance and/or psychological outcomes.

Typical Team Outcomes

The outcomes considered for team effectiveness can be broadly distinguished in two categories, task-related outcomes (performance) and socio-emotional outcomes, mostly focusing on team cohesiveness or attraction to the team.

Task-related outcomes. Most often subsumed under the label performance, these outcomes cover the degree to which the team accomplishes its task objectives. Clearly, these outcomes are crucial for team managers, as teams are generally constituted with a specific objective. Thus

increasing performance is a major concern for team managers. It is important to note that performance is team specific and depends on the task performed (for instance, problem-solving versus creative tasks). Pritchard et al. (1988) for instance stress that performance cannot be understood out of context and recommend that each organization or team design its own performance system. Examples of performance outcomes could be profitability or time to market for a new product development team, volume of sales generated for a selling team, or efficiency gains for a just-in-time inventory team.

Blau (1954) also points to the necessity to consider separately two levels of analysis in team performance studies. Studying two units in a bureaucracy, one cooperative and one competitive, he found higher team performance in the cooperative unit, but the best individual performance in the competitive unit. These results suggest that intragroup cooperation and competition can have quite different results at the individual or team levels. Other authors insist that both levels of analysis (individual and team) are relevant for team performance (Pritchard et al. 1988). This suggests the need for cross-level research on performance, measuring it at the team level and the individual level.

Socio-emotional outcomes. Socio-emotional outcomes, often labeled team cohesiveness, generally reflect goodwill towards the team. For instance, cohesiveness is indicated by the willingness to work with one's teammates, or the willingness to act on behalf of the team. These outcomes are important for organizations for two reasons: (1) one management goal is to create positive affect between different groups or departments and participation in teams can increase this affect; that is, many companies create teams as a way to generate the wanted cohesiveness between departments (Griffin and Hauser 1993; Hauser and Clausing 1988; Tjosvold, Dann, and Wong 1992); (2) team cohesiveness increases the probability that team outputs are communicated and implemented throughout the organization. This outcome is important for many teams because the success of their actions often depends on interactions with other entities in the organization (Ancona 1990; Ancona and Caldwell 1988, 1992a).

Relationship between performance and cohesiveness.

Understanding the relationship between both types of outcomes appears quite important. Indeed, one of the problems identified in the misuse of teams (Henke et al. 1993) is the focus on cohesiveness at the expense of performance. Some organizations appear to have been so focused on getting team members to like one another that

they have forgotten that the ultimate objective of using teams was to improve productivity.

It appears however that improving one outcome also helps the other. In a recent meta-analysis, Mullen and Copper (1994) investigate the relationship between group cohesiveness and performance. Their results indicate a weak positive relationship between these two constructs based on 66 separate tests of the relationship. Their study also indicates that the relationship between cohesiveness and performance is stronger when the groups are real versus ad hoc, small versus large, and when the focus is on the commitment to the task dimension of cohesiveness in contrast to pride or interpersonal attraction. Finally, Mullen and Copper (1994) find that the effects of performance on cohesiveness appear stronger than the effects of cohesiveness on performance.

Design Approach

Hackman (1987) criticizes most research in group effectiveness for its excessive focus on group processes. He emphasizes that in spite of the insights gained through this focus, it is quite difficult for managers to exert control over these processes and thus the literature fails to provide normative implications for managers involved in

teams. He proposes instead to back up and consider the effects of design factors on team processes, because it might be easier for managers to change the design factors that lead to unwanted processes than to correct the processes afterwards. Thus, he proposes to focus on inputs of the models, i.e., on the design of the team. Indeed, this approach appears consistent with the objectives of this dissertation and served as the cornerstone of the whole project.

Conclusion

This literature is helpful in many respects. First, there seems to be a consensus that team effectiveness is best understood with models of the type input-process-output. Organizing the literature in such a framework appears useful. Second, this literature helps identify two major dimensions of team effectiveness, performance and cohesiveness, which should both be considered for cross-functional team effectiveness. Finally, Hackman's (1987) contribution through his focus on team design appears consistent with the objective of providing a normative framework to managers of cross-functional teams.

This literature however does not help identify the processes or inputs to be considered when studying cross-

functional teams. The following sets of literature were reviewed for that purpose.

Empirical Literature

The empirical literature on cross-functional structures is found in two areas. First, the management literature has given a fair amount of attention to project management, or the management of given projects or ventures. For example, researchers have investigated the Apollo project, projects that necessitate the constitution of a project team to be realized. Project management structures typically cut across functional barriers and it appears important to understand what has been described in this type of structures for cross-functional team effectiveness. The second type of literature to be reviewed consists in very recent literature on cross-functional teams. These teams have barely started to be studied in management and the few existing studies in this area are reported.

Project Management

Although project management seems to include many different things, a few constants can be identified in this

form of management. A project management group is a team of individuals, usually from different functional areas, formally brought together in order to manage a given project. Projects can cover a wide range, but they are typically time bound, which means that teams are dismantled once their objectives have been fulfilled. As long as a project lasts, there is typically one individual, the project manager, responsible for the activities of the team.

Researchers studying existing project management groups have identified a number of problems when implementing such structures. Most authors in this area stress that this type of organization creates a climate ripe for conflicts (e.g., Butler 1983). Two major types of conflicts can be distinguished, conflicts with entities external to the project management group and conflicts internal to the group.

External conflicts. Project managers appear particularly likely to get in conflict with functional areas and in particular with functional managers. Sources of conflicts between project and functional managers can be subsumed under two categories. First functional and project managers compete for limited resources (Butler 1973, 1983); second, project management's success depends largely on functional resources (Butler 1973). Although

competition for resources can be direct (e.g., the project manager asks the marketing department to prepare a market analysis for a given product), indirect competition is even more frequent. The implementation of project management implies a change in the allocation of resources within the company. The resources granted to the project manager are no longer available for functional managers (Butler 1973, 1983). The implementation of project management is not only likely to alter the allocation of financial and material resources, but also the balance of power and prestige within the company. Because of top management's interest in the project's success, project managers and their staff are likely to become important players within the company, in many ways bypassing the standard channels of power and promotion. Such an emergence is likely to be a source of irritation for functional managers (Butler 1983).

Another source of external conflict stems from the fact that although typical project managers do not have any formal authority over functional managers, their jobs imply that they depend to a large extent on functional managers' resources (Jones and Wilemon 1972). Personnel resources are particularly crucial. To fulfill their objectives, project managers need to compose teams of experts from the suitable functional units. To improve the chances of

success of a project, project managers try to recruit in their teams the best functional experts available in the company (Butler 1983). Such a recruiting is likely to strain the personnel resources of the functional units (even more so when there are multiple projects simultaneously). As a consequence, the performance of functional units can be affected negatively, which is also a ground for conflicts between functional and project managers.

Internal conflicts. Project managers not only face conflicts with functional managers, but also with the functional employees they recruit. Indeed, employees tend to be reluctant to quit their functional area, even for a short period, to join a project management team (Butler 1973, 1983, Kerzner 1983). This reluctance can be explained by multiple factors. A major factor is the employees' uncertainty as to how their participation in project teams affects their future. Promotion typically is granted within functional areas and employees tend to feel insecure about being out of sight of their functional managers and colleagues, who are responsible for their promotion (Butler 1983). Thus, employees can be concerned that their expertise might not be recognized appropriately within the context of a cross-functional team. A related concern is the risk of losing one's expertise as a result

of the lack of contact with other specialists from the same area. In a society where the development of expertise requires more and more specialization, one of the risks of project management is that the experts lose their commitment to their functional expertise and thus their utility to the project (Butler 1983). This paradox--that employees need to be committed to their functional areas to be competent and yet need to put this commitment aside for a time to put the project as a priority--appears to be the key to many problems in project management.

Ambiguity about the objectives of a project and about their role in a project team can also make employees feel reluctant to join such a team (Jones and Wilemon 1972). Based on an observation of NASA's Apollo program, these authors suggest the importance of establishing specific objectives for a project and making sure they are understood and accepted by team members. Role ambiguity is also a source of insecurity in project teams assignments. Unlike functional jobs characterized by specific job descriptions, roles in project teams are typically fuzzier due to the coactivity of individuals from different areas (Butler 1983, Jones and Wilemon 1972). Communication problems within teams made up of professionals from different disciplines also appear to be the rule (Butler 1983, Morton 1983).

Another source of internal resistance to project teams is that these teams typically promote different values than functional units. In project teams, risk and failure are an inherent part of the process (many projects never reach commercialization). The emphasis is on completion of a given task within a specified period and groupwork tends to be the rule. These are all characteristics of a structure oriented toward change, as opposed to the status quo oriented functional units (Butler 1983). Such an environment is typically more stressful than a functional unit, particularly for employees who are not used to it. Ironically, this same difference in environments can lead to a reverse problem: employees who really enjoy the challenging ambiance of a project team might be reluctant to see a project come to an end. In extreme cases, these employees can be completely demotivated once reintegrated in their original functional area (Butler 1973).

Finally, the major task of project managers is the creation of a cohesive group out of individuals with different backgrounds (Butler 1983, Morton 1983). This task is made difficult by the fact that project managers typically have very little power to reward and punish their team members (Jones and Wilemon 1972). For example, Kerzner (1983) recommends that managers avoid administering dual (functional and project) rewards simultaneously. He

advises the adoption of a system where direct rewards (pay, promotion) remain under the control of the functional manager, whereas the project manager can offer indirect rewards (challenging assignment, motivating work, referent power). He also insists that project managers should make clear that they transmit to the functional area their evaluation of the employee's performance within the team--a condition which limits the ability of project managers to reward team members.

In general, most of the problems encountered by project managers are due to the existence of a dual structure (Butler 1983). Employees suddenly find themselves confronted with two supervisors (functional and project), unclear responsibilities, and frequent goal conflicts. When assigned to a team on a part-time basis, they must juggle between their responsibilities in both structures and set priorities between both.

Cross-Functional Teams

Research on cross-functional teams per se has only recently appeared in management literature. Two approaches can be distinguished--descriptive research and empirical tests. Given the novelty of the topic, some researchers have focused on describing the typical problems occurring

in cross-functional teams management and proposed a number of recommendations for effective management on the basis of interviews with managers and of observations. A few other researchers have focused on more specific issues of cross-functional team management and developed frameworks and surveys to test empirically the issues of concern.

Descriptive research. The first group of researchers, using interviews and observations, describe the benefits and costs involved in the use of cross-functional teams. Cross-functional teams appear to have implications (both positive and negative) on performance and on organizational structure.

In terms of performance benefits, cross-functional teams have the potential to favor adaptiveness and innovation and to increase synergy and coordination between the actions of different departments due to the mix of skills present within the team (Raskas and Hambrick 1992, Henke et al. 1993).

These teams also present some attractive facets from an organizational point of view. They generate wider networks within the company and broaden the perspective of the individuals involved (Raskas and Hambrick 1992). In that sense, they enable the firm to generate broader management talent and facilitate mobility opportunities for employees. The use of cross-functional teams also helps to

decentralize decision making and to reduce information overload at higher levels (Henke et al. 1993).

Organizational costs of managing a cross-functional team include the depletion of resources within the functional departments, whose members are assigned to other cross-functional tasks, tensions between departments and teams (dual structure issues similar to the ones stressed in the project management literature), and problems in defining the accountability of team members and setting up the right reward structure (Raskas and Hambrick 1992).

Cross-functional teams can also use functional experts suboptimally, assigning them to projects where their functional expertise is not always necessary (Raskas and Hambrick 1992). Henke, Krachenberg, and Lyons (1993) also mention that many cross-functional teams suffer from "meetingitis", i.e., the tendency "to meet increasingly more frequently and for more and more reasons". A by-product of this phenomenon is that some team members spend time in meetings where their expertise is not needed.

A few authors (e.g., Henke et al. 1993, Katzenbach and Smith 1993) also detail a number of ways by which teams can be mismanaged, thus exacerbating the costs and limiting the potential benefits of teams. In effect, these authors focus on factors that make a difference between successful and non successful teams. They identify three areas of

mismanagement: insufficient individual preparation or qualification to teamwork; poor team leadership; and misdirected support offered to the team by the organization. Individual problems can occur when the individuals are not committed to the team and to its objectives or when the team members lack interpersonal skills, whether because of personality traits or of insufficient training (Henke et al. 1993, Katzenbach and Smith 1993). Leadership issues include excessive meetings (Henke et al. 1993). Finally, teams can run into problems when their goals and objectives are not clearly defined by management (Katzenbach and Smith 1993) or when their areas of responsibilities and authority in terms of decision making are not clearly defined (Henke et al. 1993). In effect, this notion is related to the notion of accountability stressed by Katzenbach and Smith (1993). These authors emphasize that in high performing teams, both the team and the team members are held accountable for their performance.

Empirical tests. Ancona and Caldwell (1992b) and Pinto and Pinto (1990) concentrate on specific characteristics of cross-functional teams and test empirically some propositions on these characteristics. Pinto and Pinto (1990) focus on the level of cooperation reached in cross-functional teams. They classify 72

hospital project teams in two groups, high cooperation teams and low cooperation teams. Their results indicate that high cooperation teams are more successful in introducing new programs and have a greater tendency to communicate informally than low cooperation teams. Thus, their study indicates that the degree of cooperation obtained within a cross-functional team can influence its performance.

Ancona and Caldwell (1991, 1992b) study the relationships between diversity, team processes, and performance in 45 new product teams in high technology companies. Specifically, they focus on the effects of functional and tenure diversity on internal processes--the team members' perceptions of task-related group processes--and external processes--the degree to which team members communicate with non-team members. They also investigate the effects of both diversity and processes on performance as perceived by the team and performance as perceived by management.

Their results indicate that tenure diversity leads to more effective task processes within the group, whereas functional diversity leads to high levels of external communication. The relationships between processes and performance show interesting patterns. Effective within-team processes are positively related to self-rated

performance but unrelated to managers' ratings of performance. High levels of external communication are positively related to managers' ratings of performance but negatively related to self ratings of performance. Finally, investigating the direct effects of diversity on performance shows that diversity is negatively related to performance. Thus, even though diversity was shown to improve some group processes, its direct effects on performance were found to be negative. The authors conclude that the relationship between diversity and performance is quite complex and that positive effects of diversity on some team processes might be offset by direct effects on team performance. Thus, this study appears very important given the focus of the present dissertation on investigating specifically the effects of team composition on performance.

An important limitation of Ancona and Caldwell's (1992b) study is linked to the choice of their measure of functional diversity. They use as a measure:

$H = - \sum P_i (\ln P_i)$, where P_i is the fractional share of team members assigned to the team from the functional area i . This measure of entropy is recommended by Teachman (1980) for the measurement of inequality based on qualitative variables. Although this measure has been shown to avoid many of the statistical problems encountered

by other measures of inequality, its substantive meaning is less clear. Two problems appear particularly of concern when measuring functional diversity. First, this measure ignores duplication of expertise within the team. Second, it does not acknowledge the uniqueness of skills and knowledge between functional areas. These two limitations need to be further detailed.

To get a better understanding of this measure of functional diversity, a few examples of this measure with teams of 10 members each are proposed. H takes the values: 1.61 for a team with 2 members in five different areas; 1.22 for 6 members from area A and 1 from areas B, C, D, and E; 1.08 for 4 members from area A and 3 each for areas B and C; 1.02 for 5 members from area A, 3 from area B, and 2 from area C; .95 for 6 members from area A, 2 from area B, and 2 from area C; .94 for 7 members from area A and 1 each from areas B, C, and D; and .89 for 6 members from area A, 3 from area B, and 1 from area C.

Thus, this measure increases as the number of functional areas in the team increases and is highest when, given the same number of functional areas, the representation of the functional areas is balanced within the team. Because the measure does not account for team size, the same functional diversity would be found for a team with 5 team members in 5 different functional areas

and for a team with 10 team members and 2 representatives from 5 functional areas. Yet, these two teams are very different in terms of the amount of overlap of expertise present within the team. In the first team, the amount of overlap is close to zero, in the second case, overlaps exist for each member. Thus, this measure of diversity does not give any insights in how much overlap there is within the team. Given that the team represented in Ancona and Caldwell's (1992b) sample were averaging around 10 members and in general encompassed around 3 functional areas, we find that the highest levels of diversity were found in their sample in cases where each functional area was showing a high degree of overlap (balanced team, where the team has a balanced number of members for each functional areas) in contrast to teams where the overlap is restricted to one functional area. Thus, there is a potential confound in the measure used with the nature of the duplication of expertise within the team. In the case of a balanced team, if we consider that two people from the same functional area exhibit a higher degree of duplication of expertise than two people from different functional areas, we find that everybody's expertise is duplicated within the team. In contrast, in an unbalanced team (rated lower in diversity with the entropy measure), a few individuals in the team have no duplication of expertise at

all. It appears necessary to investigate separately these two constructs, diversity and duplication of expertise.

Another limitation of this measure is that it does not take into account the nature of the functional areas involved. Thus, teams will get the same diversity score if they have the same number of functional areas represented and the same distribution of members across functional areas, regardless of the nature of these functional areas. Intuitively though, there should be a difference in the diversity scores of the three following teams. Team A: 3 members from R&D, 5 from sales, and 1 from marketing; team B: 3 members from marketing, 5 from sales, and 1 from R&D; team C: 3 members from marketing, 5 from sales, and 1 from advertising.

These three teams would get the same score with the measure used by Ancona and Caldwell (1992b). Yet if we consider that marketing, sales, and advertising are closer to one another than to R&D, we would expect diversity to decrease from the first team to the second and from the second to the third.

The difference between Team B and Team C is due to the different nature of the functional areas represented. In Team C, the shared knowledge between the functional areas is quite small, because the representatives from these functional areas to some extent have the same background

and (commercial) training. Replacing the advertising representatives by R&D representatives is expected to increase diversity, because the shared knowledge between engineers and marketing executives is less than the one within business executives. Thus, changing the nature of the functional areas within teams should change the degree of diversity within the team. Although this is an issue with the measure used in Ancona and Caldwell's study, it is not expected to have biased their results because all their teams were of the same nature (new product development teams). It is however important to be aware of this problem when different types of teams are compared.

Clearly, the difference between Teams A and B is due to the different representation in the team of the functional area that is most distant from the others in the team. Team A appears intuitively more diverse because there is greater representation of the area that is distant to everybody else in the team. Out of the potential 45 dyadic relationships in the team-- $N(N-1)/2$ (where N is the number of team members)--, we find in Team A a total of 24 distant relationships and 21 close relationships-- $[N_m(N_m-1)/2] + (N_r(N_r-1)/2) = 15 + 6$, where N_m is the number of team members from sales and marketing, and N_r the number of team members from R&D]. In contrast, the same computations for Team B yield a total of 9 distant dyadic

relationships and 36 close relationships for the same total of 45 dyadic relationships. These numbers suggest that Team A is more diverse than Team B. Given that Ancona and Caldwell (1992b) do not take such phenomena into account into their measure, the interpretation of their results is unclear. It is not clear how their results would change if they had taken into account this phenomenon and the influence of differential distances between functional areas will have to be investigated in more detail in the current project. Distance is not represented in the notion of functional area and needs to be incorporated otherwise. Including measures of diversity of values within the team should complete this measure of functional diversity because it would explicitly include content within the study.

In summary, the literature on cross-functional teams raises a number of issues that can affect the effectiveness of these teams. Although some of the advantages of cross-functional teams appear clear (potential due to diversity of expertise, increased cooperation between functional areas), these teams also appear to generate their own problems and there are many ways by which they can be mismanaged. Although Pinto and Pinto (1990) and Ancona and Caldwell's (1992b) studies are interesting, they suggest the need for a more comprehensive empirical study of cross-

functional team effectiveness. Pinto and Pinto's (1990) focus on a very narrow issue. Ancona and Caldwell's (1992b) study is more comprehensive, but a number of issues can be raised with their operationalization of one of the key characteristics of cross-functional teams, functional diversity. These issues will need to be addressed in the empirical part of this dissertation.

Conclusion

An important characteristic of the literature reviewed in this section is its atheoretical character. Most of this research is purely descriptive in character. The unspoken consensus in this literature seems to be that by studying many companies, researchers will eventually find the key factors that differentiate successful from non-successful managerial ways. Indeed, researchers so far have been trying to find the characteristics of the "successful" form of horizontal structure and to propose ways to get closer to this "ideal" (e.g., Katzenbach and Smith 1993). So far however, little effort has been exerted to make all cross-functional teams more effective. With the exception of Pinto and Pinto (1990), and Ancona and Caldwell (1992b), there has been very little empirical research so far that has tested empirically theoretically-

driven propositions on the effectiveness of cross-functional teams. Most of the research has been strictly descriptive and prescriptions have been based on insights gained from managers' experiences rather than on theoretical frameworks. This limitation points to the interest of considering theoretical frameworks of team effectiveness for possible application to cross-functional team effectiveness. These frameworks might be helpful in identifying factors that help make any type of cross-functional team more effective.

Group Motivation Theories

Given that performance is the main objective for cross-functional teams, motivating members of these teams appears crucial for their success. Historically, the first concern of small group researchers has been to understand why in some circumstances, working in the presence of others led to improved performance (social facilitation) and why in other circumstances it led to impaired performance (social inhibition, or more recently, social loafing). Thus, these two streams of research are concerned with the effects of groups on individual performance. Two other streams of research focus more specifically on group processes and group performance per

se. Research on competition and cooperation is concerned with the effects of different reward structures on group motivation and thus on performance. Researchers in organization behavior have recently applied individual motivation theories to group behavior in goal setting studies. A final stream of research of interest is the literature on the effects of group composition on motivation and performance.

Effects of Groups on Individual Performance

Social facilitation. When comparing the performance of an individual working by him/herself to the performance of the same individual working in the presence of others, changes in performance are noticed. However, these changes are not consistent: sometimes performance is improved, sometimes it is impaired. In the first empirical test of this phenomenon, Triplett (1898) finds both types of effects.

Zajonc (1965) offers the first major explanation for these contrasting results. Reviewing the empirical literature up to 1965, Zajonc (1965) shows that facilitative effects are found for well learned responses and inhibitive effects for new responses. Thus, his review shows that the presence of others helps performance when

the task at hand is easy and familiar to the subjects, whereas it impairs performance when the task is new or difficult. This research thus suggests the importance of incorporating task difficulty in frameworks of team effectiveness.

Recent explanations for social facilitation effects focus around the idea of evaluation apprehension (Geen 1989). Thus, one of the main reasons identified for social facilitation is that the presence of others, whether observers or coactors, is perceived as a potential for reward or punishment. For a new or difficult task, fear of failure generates anxiety, taking away some of the resources which would normally have been attributed to the task (Geen 1989). This explanation stresses the importance of reward factors for team effectiveness.

Social loafing. As reported and replicated by Ingham, Levinger, Graves, and Peckham (1974), Ringelmann observed at the turn of the century that the performance of a group of workers pulling on a rope was inferior to the sum of their individual outputs. This type of group task is defined by Steiner (1972) as a maximizing (everybody is meant to give his/her best possible effort), unitary (no division of labor), and additive task. As a consequence, Ringelmann's observation suggests that performance is inhibited by working in group. This result is at odds with

social facilitation theory, which would predict an improvement in performance for such a simple task. First called the Ringelmann effect (Ingham et al. 1974), this finding has been explored in more detail and renamed social loafing by Harkins and his colleagues. Thus, social loafing refers to the fact that individual performance tends to be lower when performing in group than when performing alone.

In a series of papers on social loafing, Harkins and his colleagues explore the domains in which social loafing appears and focus on ways to limit this phenomenon. Social loafing has been replicated on activities such as hand clapping, cheering (shouting) (Latane, Williams, and Harkins 1979), brainstorming (Maginn and Harris 1980), air pumping (Kerr and Bruun 1981). Although these tasks are quite diverse, they all share the same characteristics, i.e., all are maximizing, unitary, and additive. Harkins, Latane, and Williams (1980) designed an experiment to eliminate the possibility that the effect was simply due to coordination losses, as suggested in Steiner's (1972) theory. In the case of clapping, for instance, coordination losses could stem from the fact that individuals in group do not clap at exactly the same time; thus, the overall noise level obtained would not be as high as it could be from adding individual noise levels.

Harkins, Latane, and Williams (1980) led their subjects to believe that they would perform in group or alone and actually let them all perform alone. Their results show that social loafing occurs as a result of the instructions, thus showing that it comes from a decrease in individual participation and not from coordination losses.

A few experiments have been designed in order to reduce social loafing effects. Identifiability of individual outputs (Kerr and Bruun 1981, Williams, Harkins, and Latane 1981), task difficulty and task uniqueness (Harkins and Petty 1982), and personal involvement (Brickner, Harkins, and Ostrom 1986) have been shown to significantly decrease social loafing. Harkins and Jackson (1985) refine the notion of identifiability by showing that this concept by itself is not enough to reduce social loafing; identifiability has to be completed with comparability of output from other members. Harkins and Jackson (1985) show that when group members have reason to believe that their outputs could not be compared with one another and as a consequence not really evaluated, identifiability of performance does not reduce social loafing. This result is important for the purpose of this paper because this situation is likely to occur in cross-functional teams. Indeed, although these types of teams present the advantage that members make unique

contributions, they also create the possibility that these contributions cannot be compared to one another, thereby increasing the opportunity for social loafing.

In a related paper, Kerr and Bruun (1983) investigate the influence of dispensability of effort. They propose that as one's effort within the group becomes more dispensable, motivation to exert effort decreases and name this phenomenon the free rider effect. They stress that these motivation losses cannot be due to social loafing, because all their manipulations imply identifiability of effort. Of interest is the fact that instead of focusing exclusively on additive tasks, they explicitly consider disjunctive, conjunctive, and additive tasks in their empirical work. Kerr and Bruun (1983) propose that for disjunctive tasks, because the only output taken is the best output, low ability members are likely to free ride. On the other hand, for conjunctive tasks, where the group output is only as good as the worse member's output, high ability members are likely to free ride. In both cases, free riding should increase as group size increases, because dispensability increases with size. In a series of experiments, Kerr and Bruun (1983) find support for these propositions.

Conclusion. In general, both approaches of group motivation suggest the importance of evaluation on

performance. Indeed, this insight is not very surprising, because the impact of evaluation and its corollary, reward structure, has long been recognized as an important factor for individual motivation and performance. However, because these two approaches are concerned with individual behavior and consider the group as a mere setting, they have to a large extent failed to consider the fact that they are dealing with groups. Researchers consider the influence a group setting has on individual performance, but the group and its performance are not of interest per se. For this reason, the main focus on evaluation has been to design individual reward structure or evaluation processes and never group structures. Shepperd's (1992) propositions are a notable exception to this tendency.

Focus on Group Performance and Group Processes

Reward structures: cooperation and competition. In contrast with the research reviewed above, research on competition and cooperation specifically addresses group concerns. Researchers in this area are primarily interested in group processes and especially in the effects cooperative and competitive reward structures have on both individual and group performance. In this sense, this

literature appears to address many of the issues of concern in this paper.

Research on cooperation and competition for the most part relies on pioneering work by Morton Deutsch (1949a, 1949b). Deutsch (1949a) defines cooperation as a situation where any individual in the group can attain his/her goals only if all other individuals in the group also attain their goals (promotively interdependent goals). In contrast, competition is defined as a situation where, if any individual attains his/her goals, the other individuals will to some degree be unable to reach their goals (contriently interdependent goals). Among the consequences of this definition, Deutsch (1949a) proposes that cooperative situations will create more diversity within the group than competitive situations. The rationale is that in a cooperative group, if any member has the necessary skills to accomplish one part of the task, there will be no need for someone else to accomplish this part. In contrast, in a competitive situation, different members strive to manage everything by themselves and there is more overlap in their contributions.

Deutsch (1949b) tested the major hypotheses developed in his framework. As has typically been done since, he operationalized cooperation and competition through the manipulation of reward structures. In his study, Deutsch

(1949b) used two tasks, a puzzle problem-solving task and a task where subjects had to give written recommendations about human relations problems. Both outputs could be scored. A cooperative condition was one where the pair receiving the highest score would get a reward. In the competitive situation, individual contribution within the pair was evaluated and rewards given to the best performer in one case (puzzle), or proportionally to contribution in the other (human relations problems). This procedure was repeated over a five weeks period. Deutsch (1949b) generally finds support in this study for the superiority of cooperation over competition.

Hammond and Goldman (1961) introduce an important distinction between intragroup processes and intergroup processes. Indeed, although Deutsch's (1949a) definitions pertain to intragroup cooperation and competition, his operationalization of cooperation (Deutsch 1949b) is in fact a manipulation of intergroup competition (Hammond and Goldman 1961). Myers (1962) and Julian and Perry (1967) find evidence for a higher degree of motivation in a situation where group members cooperate with one another within the group and compete with other groups. This result is not surprising inasmuch as it generates a "us versus them" feeling, thus enhancing attraction to the group. Recent research by Turner and his colleagues (e.g.,

Turner 1991) on social identity shows that individuals identify themselves more to a group when they are in this type of "us versus them" situation. Because many organizations set up teams to be in competition with one another, this dimension of the reward structure appears an important complement to the intrateam structure.

Another important distinction in the literature is between goal and task interdependence. Miller and Hamblin (1963) and Raven and Eachus (1963) point to the difference between goal interdependence as used in Deutsch's (1949a) definitions of cooperation and competition--where interdependence is based on goals such as rewards--and the concept of task interdependence or means interdependence as developed by Thomas (1957)--where interdependence is due to specific requirements of the task. Given the high degree of task interdependence inherent to cross-functional teams, this distinction is of particular interest for the purpose of the present paper. Raven and Eachus (1963) and Miller and Hamblin (1963) find similar results for high task interdependence situations: cooperative reward structures appear to prompt to higher performance than competitive reward structures. Miller and Hamblin (1963) also include a low task interdependence level in their design and find that this condition brings to a pure production strategy, irrespective of the reward structure. In high task

interdependence situations, with contrient goal interdependence, individuals might have an interest in blocking one another, whereas with promotive goal interdependence, they have an interest in helping one another. Both strategies can possibly lead to productivity losses for the individual (who does not produce when involved in these activities). In comparison, in low task interdependence conditions, what the others do is irrelevant for one's results (1) and under both reward structures, individuals have an interest in producing the best they can. Effects found for superior performance in competitive groups in this case are due to the motivating effects of competition (Shaw 1958). Raven and Eachus (1963) also suggest that the effects of promotive and contrient goal interdependence decay over time for high levels of task interdependence, because of a realization by subjects that competition is hurting everybody and thus a spontaneous orientation toward more cooperative behaviors. Rosenbaum et al. (1980) replicate Miller and Hamblin's (1963) results and show that even a moderate amount of competition is sufficient to generate these patterns. As stressed by Deutsch (1949a), pure competitive or pure cooperative situations within a group are quite rare and most situations are in-between. Rosenbaum et al. (1980)

show that mixed reward structures tend to have the same effects than competitive reward structures.

Goldman, Stockbauer, and McAuliffe (1977) combine approaches by manipulating three factors: intragroup reward structure, intergroup reward structure, and task interdependence. High task interdependence in their study is operationalized as a sequential task. Their results replicate Miller and Hamblin's (1963) results for the interaction between intragroup reward structure and task interdependence level. However, they find this pattern to be only replicated in conditions of intergroup cooperation. In cases of intergroup competition, the intragroup reward structure seems to have little impact, because the group's energies are directed toward the external competition and performance is generally lower ⁽¹⁾.

In summary, the literature on cooperation and competition suggests a few key results. For high task interdependence, cooperative reward structures lead to higher performance than competitive reward structures.

(1) In an experiment where subjects had to build cube towers, Rosenbaum et al. (1980) report an interesting case of sabotage in a low interdependence competitive condition. One of the subjects asked the experimenter at the beginning of the session how much time they would have to build the towers. When told the task would last 15 seconds, the subject went on his tower-building task for 14 seconds, then used his last second to sweep away all the other subjects' towers and this way won by default.

Moreover, intergroup competitive structures also appear to lead to higher performance than noncompetitive ones. Generally, this research suggests the need for distinguishing intrateam from interteam structures and for considering task interdependence in frameworks of team effectiveness.

A few caveats about this research also have to be acknowledged. First, this literature relies on very minimal groups, in the sense that most of the studies use ad hoc groups formed for the purposes of an experiment, thus groups without any history or any perspective of interactions in the future (McGrath 1984). These groups are also minimal in terms of size. Because of the costs (in subjects) involved in collecting experimental data from large size groups, most of the studies reviewed use dyads, or in very rare cases triads. Yet, there is some reason to think that pairs are a very special type of group and that some of the results might not be extended easily to other group sizes. The only exception to this problem of group minimality is the study by Blau (1954) which deals with existing organizational units of reasonable size. Second, and in a related way, the focus on ad hoc groups has led researchers to ignore some potentially interesting issues. In particular, although researchers have been concerned with intergroup processes, the only types of "other groups"

considered in the literature are groups composed of different individuals and accomplishing the exact same task. Thus, researchers have not considered the possibility that relevant other groups could be doing something else than the focal group, or that group members could actually be members of multiple competing groups in a simultaneous way. These types of situations nevertheless appear likely for cross-functional teams (for instance, part-time team members can work in multiple project teams, or in a project team and a functional area). Thus, this literature has ignore background factors such as the overall support provided to teams in the organization and have also ignored the impact of duality of reward structures.

Group goal setting. Although the definitional focus in the competition/cooperation literature is on goal interdependence, the actual manipulations of the notion of goals, as has been noted above, concern reward structures. Thus, the goal to reach is defined through rewards for a given objectives. Another stream of research has recently also been concerned with goals and particularly with the distinction between group and individual goals. To a large extent, this approach can be viewed as complementary to the one just described, in the sense that the focus is on the characteristics of the goals, whereas in the preceding

section it was on the extent to which these goals were interdependent. Thus, group goal setting researchers have been concerned with replicating the goal setting effects typical of individual behavior and to extend this theory to group performance.

Group goal setting has been found to share the major characteristics of individual goal setting: specific, difficult and accepted goals bring about the highest levels of group and individual performance (Locke and Latham 1990). Matsui, Kakuyama, and Onglatco (1987) propose that group goals have positive effects on individual performance because they increase the difficulty of individual goals and because they generate a sense of shared responsibility which increases the probability of accepting these goals. Using an additive task, they indeed show that both low ability and high ability subjects exceed their individual objectives when given group goals whereas subjects with individual goals do not exceed their objectives (Matsui et al. 1987). These results are also reflected in performance. Group goal instructions lead to higher performance than individual goal instructions (Matsui et al. 1987). Similar results are found by Mitchell and Silver (1990) using a high level of task interdependence. Mitchell and Silver (1990) also stress that for an interdependent task where cooperation gets to be automatic,

setting individual goals alone actually impairs performance by creating competition. Thus, the consensus in this research seems to be to set both individual and group goals or group goals only for better performance.

Overall, the group goal setting literature suggests the need for incorporating task difficulty and goal clarity in frameworks of group effectiveness. This literature also stresses the continuum between team and individual goals as bases of the intrateam reward structure.

Conclusion

In summary, this literature review helps to organize the different issues a manager is faced with when designing or managing a cross-functional team. First, the literature on group effectiveness provides a useful organizing framework for team effectiveness studies (input-process-output framework). This literature also helps to identify the two major dimensions of team effectiveness and also stresses the need to focus on team design factors.

Second, the empirical literature on horizontal structures and cross-functional teams points to a number of processes that are crucial when considering teams. Most of this literature focuses on two processes, interaction within the team and conflict. This literature also

suggests the importance of team composition factors such as diversity and of organizational factors such as support provided to the team and duality of structure.

Finally, the literature on group motivation clearly stresses the importance of effort as a key process in teams and also brings to the fore reward structures (intrateam and interteam in particular) and dimensions of task characteristics (difficulty and interdependence) as major design domains.

In conclusion, on the basis of this literature review, we can propose a input-process-output framework of cross-functional team effectiveness, with two types of outcomes considered (performance and cohesiveness), three processes (effort, task interaction, and conflict), and three areas of team design (team composition, task characteristics, and reward structures). Chapter 3 will explore this framework and its implications in more detail.

CHAPTER 3 RESEARCH PROPOSITIONS

As was argued in the introduction chapter, cross-functional teams are becoming more and more prevalent in organizations and marketing managers are particularly likely to be involved in such teams. So far however, there has been little integrative research effort aimed at getting a better understanding of the factors that lead to cross-functional team performance. The preceding chapter detailed some of the literature that appears important when considering cross-functional team effectiveness. This literature is expected to help answer the original questions submitted in the introduction chapter, i.e., what is the right team composition for effective performance? and what is the right reward structure for cross-functional team effectiveness?

In this chapter, a framework for cross-functional team effectiveness will be proposed. The first section of the chapter will briefly review the key characteristics of this framework. Then, the constructs present in this framework will be detailed. Finally, expected relationships between these constructs will be proposed.

Overview of Framework

The proposed framework is an input-process-output model of team performance (see Figure 1). The first part focuses on the relationships between team design factors (such as team composition, task characteristics, and reward structures) and behaviors within the team (i.e., effort, conflict, and task interaction). These behaviors (or team processes), in turn, influence two facets of team effectiveness--task performance and team cohesiveness.

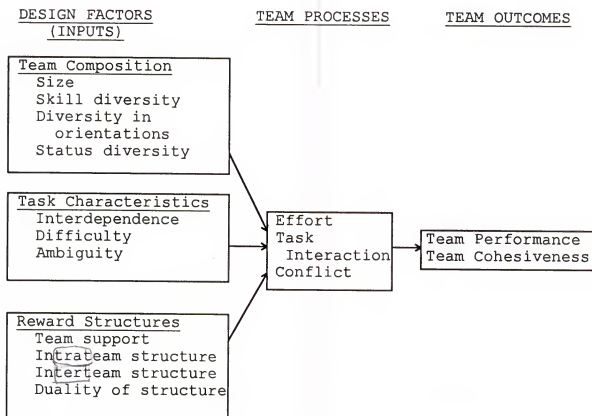


Figure 1
Framework of Cross-Functional Team Effectiveness

The focus of this dissertation is on design factors and their effects on team processes. The initial focus will be on team outcomes and team processes in order to provide a context for understanding the application of the framework. The primary focus, however, will be to identify design factors that lead to increased team effectiveness through their effects on team processes.

Team Outcomes

In general, managers who are responsible for teams are interested in maximizing team effectiveness. This effectiveness covers two key dimensions: (1) task-related outcomes, generally labeled team performance and (2) socio-emotional outcomes, usually described as team cohesiveness. Task-related outcomes cover the degree to which the team accomplishes its task objectives (such as profitability of a new product, volume of sales generated by a selling team, efficiency gains for a just-in-time team). Socio-emotional outcomes reflect goodwill towards the team (such as the willingness to work with one's teammates or to act on behalf of the team). Socio-emotional outcomes are important to organizations for two reasons: (1) one management goal is to create positive affect between different groups or departments and participation in teams

can increase this affect; that is, many companies create cross-functional teams as a way to generate the wanted cohesiveness between departments (Griffin and Hauser 1993; Hauser and Clausing 1988; Tjosvold, Dann, and Wong 1992); (2) team cohesiveness increases the probability that team outputs are communicated and implemented throughout the organization. This outcome is important for many teams because the success of their actions often depends on interactions with other entities in the organization (Ancona 1990; Ancona and Caldwell 1988, 1992a). Thus, both team performance and team cohesiveness are important facets of team effectiveness and deserve to be considered in their own right.

Although conceptually distinct, task-related and socio-emotional outcomes do have a weak empirical relationship. For instance, a recent meta-analysis reported a weak positive relationship between team performance and team cohesiveness (Mullen and Copper 1994). Levine and Moreland (1990) also report such a relationship in their review of the literature on small group research: groups that perform well also tend to exhibit a greater degree of cohesiveness. However, as stressed by these authors (Levine and Moreland 1990), because most of the studies are correlational, the direction of causality of this relationship remains unclear.

Proposition 1:

Team performance and team cohesiveness are positively related.

Principal Team Processes

Three team processes that are used widely in the literature on team effectiveness have been included in the proposed framework: effort, task interaction, and conflict.

Effort. Individual theories of motivation suggest the importance of considering effort as an antecedent of performance. Unless otherwise specified, effort refers here to individual effort exerted on behalf of the team. A positive relationship between individual effort and individual performance is well-established in the literature (e.g., Churchill et al. 1985) as is the positive relationship between the amount of effort exerted on behalf of the team and team performance (e.g., Weingart 1992).

The relationship between effort and team cohesiveness has received limited attention. In one area of research however--i.e., the "free riding" phenomenon--individuals exhibit an aversion for teams where some members work less than others (Kerr 1983). Similarly, attribution theories suggest that team members are likely to attribute lack of effort on behalf of the team to external or situational

factors (Weiner 1986). Displacement of responsibility appears a common reaction in cases of failure (Bandura 1982), which suggests that team members exerting low effort are likely to ascribe their lack of effort to factors such as low attraction to the team. Overall, the literature suggests a positive relationship between effort and team cohesiveness.

Proposition 2:

- a. Effort is positively related to team performance.
- b. Effort is positively related to team cohesiveness.

Task interaction. Task interaction is defined as the degree to which team members interact with one another to accomplish their task. This process has been examined extensively in the literature, although under a variety of names (e.g., communication in Pinto and Pinto 1990; interaction in Tjosvold, Dann, and Wong 1992; cooperation in Pinto, Pinto, and Prescott 1993). The relationship between task interaction and team performance is particularly important for teams. Previous studies show that the best teams are not always the ones with the best performers, but the ones with the highest level of task interaction within the team (Blau 1954). Pinto and Pinto (1990) also found better performance in collaborative (interactive) teams than in non-collaborative teams. Thus, task interaction appears positively related to team performance.

Classic research in social psychology indicates that interaction generally increases interpersonal attraction. People usually like (develop friendships with, marry, etc.) those people with whom they interact frequently (Insko and Wilson 1977; Newcomb 1961). Because interpersonal attraction is one indicator of team cohesiveness, as interaction within the team increases, team members are likely to exhibit more team cohesiveness.

Proposition 3:

- a. Task interaction is positively related to team performance.
- b. Task interaction is positively related to team cohesiveness.

Conflict. This process refers to the extent to which there is disagreement among team members. Conflict affects team performance and cohesiveness and is one of the most studied and most often reported processes in teams (cf. Tjosvold, Dann, and Wong 1992). On one hand, team members often refrain from exploring alternatives or expressing disagreements to avoid conflict (Cosier and Schwenk 1990; Smith et al. 1986). This situation leads to excessive conformity which can cause dysfunctional teamwork (or groupthink, as named by Janis (1972)). Thus, low levels of conflicts are detrimental to team performance. On the other hand, high levels of conflict within a team also are associated with poor performance (Butler 1983). Overall,

moderate levels of conflict have the most positive effect on team performance.

The relationship between conflict and team cohesiveness also is well-established. In general, team cohesiveness is positively associated with the pleasantness of the team processes. Because individuals typically dislike conflict and tend to avoid it, teams with low levels of conflicts are considered the most pleasant (Janis 1972). Thus, the literature suggests a negative relationship between conflict and team cohesiveness.

Proposition 4:

- a. Team performance is highest at moderate levels of conflict.
- b. Conflict is negatively related to team cohesiveness.

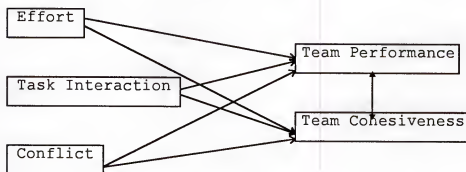


Figure 2
Relationships Between Team Processes and Team Outcomes

In conclusion, the relationships between team processes and team outcomes suggest that high levels of effort and of task interaction and moderate levels of

conflicts lead to team effectiveness. These relationships are summarized in Figure 2.

Team Design Effects

Team managers face three major decision domains when designing a cross-functional team ⁽²⁾. First, they need to decide on the team composition, i.e., how many team members are appropriate and what type of expertise is necessary. A second decision domain concerns task characteristics. Team managers need to assign a task or set of tasks to their team and to decide the team's responsibility. The third domain focuses on reward structure. Team managers for instance need to decide the amount of rewards available for their team, or whether to reward team members for

(2) An important assumption that underlies the design approach taken in this paper is a strong bias towards structural factors that affect team processes and effectiveness and not towards individual characteristics of the specific individuals actually involved in the teams. This approach implies that teams are structured in a way that makes team members replaceable or interchangeable and not structured around specific personalities (Cartwright and Zander 1968). As a consequence, even though I acknowledge that individual characteristics of the team members such as personality traits or demographics can affect team processes and effectiveness, these characteristics will not be of concern in this framework. Instead, the only individual factors considered are those that are directly linked to the structure of the teams, that is, to characteristics directly linked with the cross-functional nature of the teams considered.

individual or team performance. Specific decisions in each of these domains and their proposed effects on team processes are examined in this section.

Team Composition

One question with which team managers are confronted is the composition of a cross-functional team. The mix of individuals assembled is crucial to team success or failure. If the team has too few members, it will lack some crucial skills to accomplish its objectives. If the team has too many members, coordination among team members becomes difficult. Team composition issues are particularly important for cross-functional teams because these teams are composed of individuals from different departments. Two separate issues exist for team composition: team size (how many persons on the team?) and team diversity (e.g., how many departments, and how many persons from each department?).

Team size. Team size has received considerable attention in the literature on small group performance. Generally, researchers have found that individuals tend to exert less effort as team size increases (e.g., Ingham et al. 1974). This phenomenon, named social loafing (Latane, Williams, and Harkins 1979) appears very robust and is

difficult to avoid in a group setting (e.g., Kerr and Bruun 1981).

Proposition 5:

Team size is negatively related to effort.

The effects of team diversity on group performance appear more complex. Diversity can cover many different facets, such as functional diversity, skill diversity, tenure diversity, and socio-demographic diversity such as age, gender, or race. As mentioned in the footnote, the proposed framework focuses on cross-functional team effectiveness and only those facets of diversity that are related directly with cross-functionality are included.

Clarifying the meaning of "cross-functional" is necessary when dealing with the composition of cross-functional teams. By definition, a cross-functional team is composed of individuals from different functional areas. This definition, however, is not sufficient because the meaning of a functional area is not self-explanatory. Different companies have different norms for defining a functional area and/or different subdivisions for the same functional area. For instance, some companies can divide different marketing tasks into multiple departments, e.g., sales and distribution, product management, market research, and advertising; in other companies, a single marketing department might be responsible for all these

tasks. Thus, it is important to recognize that cross-functionality is organization-specific.

Because the meaning of a functional area is context-dependent, we will develop dimensions that transcend organizational contexts and on which team members can vary in a cross-functional team. Based on the literature, three independent (and measurable) dimensions are proposed: skills, orientations, and status. Diversity in each of these dimensions is considered in the following paragraphs for its effects on team processes.

Skill diversity. A key dimension on which cross-functional team members can vary is task-relevant skills, which generally covers the contribution each individual potentially offers to the team. Each team member brings a varied mix of skills to the team, such as knowledge (e.g., functional expertise), task-specific skills (e.g., decision-making, creativity), and access to resources within the company (Ancona 1990; Ancona and Caldwell 1988, 1992a). Interestingly, the main focus in the present framework is on qualitatively different skills, not on differences in levels of skills. This distinction is important because most of the research on skill heterogeneity has focused on groups constituted of members with different levels of skills (high-low) on a given dimension (e.g., Laughlin and Branch (1972) on an ability

test) and only rarely with different skills per se (see Ancona and Caldwell 1991, 1992b for an exception).

The literature on social loafing suggests a relationship between skill diversity and effort. Social psychologists have spent considerable effort to find ways by which to limit social loafing in groups. Their research indicates that one of the most effective ways to limit social loafing is to make individual contributions to the team identifiable (Kerr and Bruun 1981; Williams, Harkins, and Latane 1981). This can be accomplished in two ways. The first approach is to track individual outputs within the team (Williams et al. 1981). This approach, however, often proves impractical in teams where the team output is a combination of inputs that can not be traced to a single contributor. The second approach is to have team members perceive that their contribution to the team is unique (Harkins and Petty 1982). This approach is particularly interesting for cross-functional teams. When skill diversity within the team increases, team members are likely to perceive that their contribution to the team is unique, which should encourage them to exert more effort.

Skill diversity also is expected to have positive effects on task interaction. For instance, in a new product development team, team members from marketing have access to market research data whereas members from

production have access to technical reports on the feasibility of a project. The development of a new product requires integration of both types of information; thus, members of these teams need to interact and share information. Because members of cross-functional teams have access to different skills that can be needed for the team to accomplish its common purpose, skill diversity should increase the likelihood of interaction between team members (Ancona and Caldwell 1992b).

Skill diversity also is likely to generate conflict within teams for a variety of reasons. First, team members with different skills are likely to favor different approaches to solve the same problem. Second, if team members cannot evaluate the competence of the other members, they are also likely to question this competence and have conflicts on that matter. Finally, team members are likely to maintain some degree of loyalty to their functional departments. This loyalty can cause conflict within the team because team members will work to establish recognition or resources for their own department or will be reluctant to use (or commit) their department's resources (Butler 1983). Proposition 2 summarizes the relationships between skill diversity and team processes.

Proposition 6:

- a. Skill diversity is positively related to effort.
- b. Skill diversity is positively related to task interaction.

c. Skill diversity is positively related to conflict.

Diversity in orientations. Another major dimension on which members of cross-functional teams have been shown to vary is in their orientations towards a number of domains. Dougherty (1987) proposes that each functional group develop its own "thoughtworld", i.e., its own culture. A thoughtworld encompasses specialized vocabulary (usually abstruse to non-initiates), specialized knowledge and experience, and quite restricted views (Dougherty 1987). The empirical research on the relationships between marketing and other functional areas helps to identify specific areas in which the presence of such thoughtworlds is particularly apparent (e.g., Gupta et al. 1986; Lawrence and Lorsch 1967; Souder 1980, 1981). For example, Lawrence and Lorsch (1967) identify three main domains in which orientations are prone to differ: time orientation, goal orientation and orientation toward others. Time orientation is the time frame within which a team member tends to set his/her objectives. Marketing managers, for instance, typically have a shorter time orientation than R&D managers (Lawrence and Lorsch 1967). Goal orientation is the particular sector of the environment on which each team member focuses attention and energy. For example, Lorsch and Lawrence (1965) identified scientific knowledge as the main goal for R&D personnel,

market success for sales people, and production costs and processes for production personnel. Orientation toward others represents the degree to which an individual team member is concerned with the social or with the task-related aspects of the team interactions. Another domain of interest is risk orientation, or the tendency that individual team members have towards taking risks. Research in the new product development area for instance indicates that marketing managers tend to favor products with a low risk and prefer incremental innovations, whereas R&D managers favor high-risk high-return projects and radical innovations. Thus, we can expect to have team composition vary in terms of the diversity in orientations towards time, goals, others, and risk.

Previous research indicates that diversity in orientations leads team members to exert efforts in opposite directions (e.g., Lawrence and Lorsch 1967). As a consequence, team members are likely to limit task interaction because it does not increase team effectiveness. Different orientations also reduce interaction because team members differ in their perceptions of task importance and their level of commitment to the team project at different periods in time (e.g., Souder 1988). Team members with different orientations also are likely to have different views on

team priorities and to attempt to have their priorities accepted by the group (e.g., Ancona and Caldwell 1992b). These differences all are likely to create conflicts within the team.

Proposition 7:

- a. Diversity in orientations is negatively related to task interaction.
- b. Diversity in orientations is positively related to conflict.

Status diversity. Finally, status diversity within the team needs to be considered. One source of differential status is the presence of members from different hierarchical levels. For instance, a team that focuses on just-in-time delivery can include marketing managers, sales representatives, and floor workers (Peters 1992). These three groups are likely to come from different functional areas (marketing, sales, and manufacturing) as well as from different hierarchical levels (middle-managers and shop workers). Another source of differential status is the level of commitment of team members. Key contributors to the team receive respect and recognition from their teammates and thus higher status within the team (Kirchler and Davis 1986; Levine and Moreland 1990). Finally, individuals may receive status based on their functional department. For instance, in a marketing-oriented company such as Procter & Gamble,

marketing managers are likely to be granted a fairly high status in their teams.

Research in the areas of evaluation apprehension and of minority influence suggests relationships between status diversity and team processes. Evaluation apprehension research stresses that individuals are afraid to be judged by others (Cottrell et al. 1968). Thus, low status members are likely to be afraid of the social consequences (scorn) of expressing their views in front of superiors. This has been shown to limit the amount of task interaction within teams (Collaros and Anderson 1969). The literature on minority influence also suggests that status differences (which create minorities within groups) generate conflicts within teams (e.g., Islam and Hewstone 1993).

Proposition 8:

- a. Status diversity is negatively related to task interaction.
- b. Status diversity is positively related to conflict.

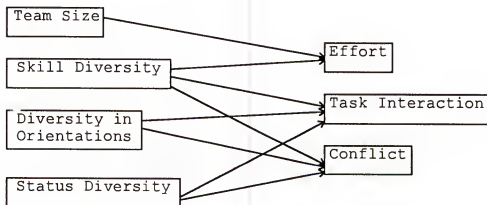


Figure 3
Effects of Team Composition Factors on Team Processes

Figure 3 summarizes the proposed relationships between team composition factors and team processes.

Task Characteristics

Another important design area on which marketing managers can have an impact on team effectiveness is task characteristics. Based on previous research in organizational behavior and group performance, three dimensions of task characteristics appear of particular concern for managers involved in teams: task interdependence, task difficulty, and task ambiguity.

Task interdependence. Task interdependence is the degree to which the performance of any team member depends on how other team members perform their tasks. One major reason to create a cross-functional team is that the team's task requires integration of the different members inputs. As a consequence, most cross-functional teams are unlikely to focus on tasks with very low interdependence, such as the additive, conjunctive or disjunctive tasks described in Steiner's (1972) task typology. Instead, these teams are usually involved in relatively interdependent tasks. Still, task interdependence is expected to vary as some cross-functional teams favor simultaneous over sequential task processing (Thompson 1967).

Previous research on group behavior indicates that as the task becomes more interdependent, team members interact more with one another (Miller and Hamblin 1963; Raven and Eachus 1963; Rosenbaum et al. 1980). Thus, task interaction is expected to increase as a result of increased task interdependence. Simultaneously, because task interaction is imposed by the task requirements and not freely chosen, conflicts also are more likely to occur.

Proposition 9:

- a. Task interdependence is positively related to task interaction.
- b. Task interdependence is positively related to conflict.

Task difficulty. Task difficulty also is an important task characteristic because cross-functional teams typically are created to accomplish tasks that would be too difficult for any individual or functional area. Generally, the classic results of goal setting theory have been replicated at the group level (Matsui, Kakuyama, and Onglatco 1987): researchers have found that individuals are more motivated at moderate levels of difficulty than at either low or high levels of difficulty. Thus, team members appear more motivated to exert effort for a challenging task than for an easy one, but can get discouraged if the task is clearly beyond their abilities.

Proposition 10:

- Effort is highest at moderate levels of task difficulty.

Task ambiguity. Finally, task ambiguity, or the degree to which the task assigned to the team is defined clearly, also appears a concern for team managers. Two dimensions of task ambiguity have been distinguished in the literature: (1) goal ambiguity refers to the extent to which the team's objectives are clearly defined and (2) role ambiguity concerns the clarity with which responsibilities are shared among the team members. Because of groups' preferences for unambiguous over ambiguous goals, effort appears to diminish when team goals are ambiguous (O'Leary-Kelly et al. 1994). Goal ambiguity also appears to hinder task interaction and generate conflicts (Katzenbach and Smith 1993). Similarly, role ambiguity also appears to constrain motivation, limit task interaction, and engender conflicts. For example, an ambiguous distribution of roles and responsibilities can be used by team members as an excuse for free riding. This ambiguity also leads to arguments about who should be in charge of which subtasks and thus to conflicts within the team (Henke, Krachenberg, and Lyons 1993; Morton 1983).

Proposition 11:

- a. Task ambiguity is negatively related to effort.
- b. Task ambiguity is negatively related to task interaction.
- c. Task ambiguity is positively related to conflict.

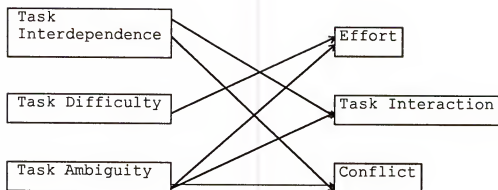


Figure 4
Effects of Task Characteristics Factors on Team Processes

Figure 4 summarizes the proposed effects between task characteristics and team processes.

Reward Structures

Designing team reward structures is an important decision by team managers and also one where the lack of guidelines is particularly troubling (Wall Street Journal 1995). Although there has been substantial research in marketing management about compensation systems for salespersons, research on team reward systems is almost non-existent. Research in the areas of small group performance and of project management suggests that four levels of reward structures influence team effectiveness: 1) overall support, 2) intrateam, 3) interteam, and 4) dual reward structures. The term reward is used in an unrestricted manner. Thus, rewards encompass traditional

financial rewards such as salary and bonuses, but also intangibles such as recognition, promotion, etc.

Team support. The first reward issue is the overall level of support granted to the team. Organizational cultures vary in the degree to which teams are valued and rewarded. For instance, consulting groups such as McKinsey (as related by Peters 1992) tend to use teams for most of their activities. In such cultures, organizations grant teams the resources needed to accomplish their task (e.g., personnel, financial resources) and explicitly reward employees for participating in teams. Other companies, however, are not committed to teams and do not provide many rewards to individuals who participate in teams (both in terms of resources to the team and of rewards for participation to the team). Clearly, these different cultures toward teamwork and more specifically, the extent to which the focal team is supported by the company and participation to the team rewarded within the company, are likely to affect motivation to work on a team. The literature on project management reports a greater motivation when project members perceive that top management supports the project and views it as a priority (Jones and Wilemon 1972). Similarly, recent research on high performing teams indicates greater effort when the organizational culture generally favors teams (Katzenbach

and Smith 1993). Overall, organizational support for the team seems to increase effort.

Proposition 12:

The degree of organizational support granted to the team is positively related to effort.

Intrateam reward structure. Once the overall level of rewards for a team is determined, team managers need to decide on how to allocate these rewards within the team. At one extreme, rewards can be based exclusively on team performance, where everybody in the team gets the same rewards regardless of their level of contribution in the team. At the other extreme, rewards can be exclusively individual, based on the inputs or outputs of each team member. Most often, reward structures are mixed, with part of the rewards received by team members based on overall team performance, part on individual performance (Davis, Laughlin, and Komorita 1976). Group goal setting research indicates that team members exert more effort when intrateam rewards are based on group goals solely--or combinations of group and individual goals (Mitchell and Silver 1990)--than when based on individual goals (Matsui et al. 1987; O'Leary-Kelly, Martocchio, and Frink 1994; Weingart 1992; Weingart and Weldon 1991). Rosenbaum et al. (1980) have shown that as the proportion of individual rewards over team rewards increases, the intrateam reward structure becomes more competitive. Thus, individually-

based reward structures are more competitive than mixed structures. Johnson et al. (1981), in a meta-analysis of the literature on reward structures, found that cooperative (team-based) structures outperformed competitive (mixed) structures, which were superior to individualistic structures. Thus, their results also indicate that, as the proportion of individual rewards over team rewards increases within the team, effort decreases. The competitiveness of the intrateam reward structure has been shown to affect conflict and task interaction. Competition appears to generate conflict and generally discourage task interaction within the team (e.g., Rosenbaum et al. 1980).

Proposition 13:

- a. As the proportion of individual rewards over team rewards increases within the team, effort decreases.
- b. As the proportion of individual rewards over team rewards increases within the team, task interaction decreases.
- c. As the proportion of individual rewards over team rewards increases within the team, conflict increases.

Interteam reward structures. Reward structures

between teams are characterized by their degree of competitiveness. The most competitive structures are those where the focal team only can reach its objectives if other groups (teams and/or departments) do not reach their objectives (Deutsch 1949a; Johnson et al. 1981). Thus, competitive structures correspond to situations where the team rewards are based on relative performance (i.e.,

comparing the performance of a team to that of another). These situations can occur when multiple teams are asked to work in parallel on the same project, or more commonly, when the focal team competes with other groups for access to resources within the company. Less competitive interteam structures are those where the team rewards are based on absolute performance (attainment of given team objectives). Finally, anti-competitive (or cooperative) structures correspond to cases where a team can only reach its objectives if the other teams also reach their objectives.

If the competitiveness of the interteam reward structure is increased, then an "us versus them" feeling is likely to be created and will help to forge a social identity for the team (Turner 1991; Turner and Oakes 1986). This identity is likely to have a number of effects. First, individuals are likely to exert more effort on behalf of the team when they are in competition with other teams (Hammond and Goldman 1961; Julian and Perry 1967; Mitchell and Silver 1990). Second, group competition also appears to reduce internal conflict and increase task interaction by creating a common external threat to the team (Julian and Perry 1967).

Proposition 14:

- a. The competitiveness of the interteam reward structure is positively related to effort.

- b. The competitiveness of the interteam reward structure is positively related to task interaction.
- c. The competitiveness of the interteam reward structure is negatively related to conflict.

Duality of reward structure. Finally, a dual reward structure exists whenever individual rewards come from a variety of sources in the company (Butler 1983). In the case of a team, a dual structure implies that parts of the team members' rewards are linked to their performance on assignments unrelated to the team. From the team perspective, as the proportion of non-team related rewards over team-related rewards increases, the reward structure becomes more dual. As duality increases, team-related rewards are less instrumental to the individual (for instance promotion). Thus, the effectiveness of team rewards diminishes, which has a direct negative effect on effort (Butler 1983). Duality also implies that team members have to balance their time between multiple assignments, which not only limits the amount of time available for teamwork and task interaction but also appears as the source of many conflicts within teams (Butler 1983).

Proposition 15:

- a. The duality of the reward structure is negatively related to effort.
- b. The duality of the reward structure is negatively related to task interaction.
- c. The duality of the reward structure is positively related to conflict.

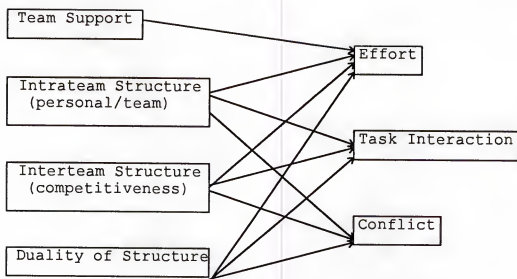


Figure 5
Effects of Reward Structures Factors on Team Processes

The relationships between reward structures and team processes are summarized in Figure 5.

CHAPTER 4

MARKSTRAT STUDY: DESIGN AND METHODOLOGY

The research propositions developed in Chapter 3 were tested through two independent and complementary studies. Due to a trade-off between realism of the study and control over the constructs, two empirical tests were undertaken. The first study, which is described in Chapter 4 and 5, was designed to maximize experimental control. In that study, the proposed framework was tested in a quasi-experimental context through the use of teams of MBA students playing a marketing strategy simulation game, MARKSTRAT. In contrast, the second study was designed to maximize realism. In that study, actual cross-functional teams operating in a number of companies were surveyed. Chapters 6 and 7 describe this second study.

The first objective of the MARKSTRAT study was to test the framework developed in the preceding chapter in a relatively controlled environment, with enough control over the constructs to provide a clean test of the hypothesized relationships. Using a simulation game allowed such a control and also allowed me to manipulate a key factor in the framework, namely the intrateam reward structure. Two groups were assigned to different types of reward

structures, thus enabling to test the effects of this factor in a quasi-experimental manner.

The second objective of this study was to provide an extensive pretest for the main study with actual teams in industry. The methodological approach was similar in both studies (questionnaire survey, similar analysis plan). Thus, this simulation game allowed pretesting at a low cost the approach to be used in the main study. The design of the main study attempted to avoid the limitations uncovered through this quasi-experiment.

The present chapter details the methodological approach used in the MARKSTRAT study. First, the simulation game used is presented, as well as the constructs this game allows to manipulate. In a second section, the characteristics of the sample are detailed. The third section details the data collection procedure. Finally, the last section examines the measures used to operationalize the different constructs.

MARKSTRAT: A Marketing Strategy Game

MARKSTRAT, a simulation game commonly used in MBA programs for developing marketing strategies, was used in this study. This game was chosen because of its focus on broad marketing issues. MARKSTRAT also presented a number

of key characteristics that made it an interesting environment in which to test the framework developed in this dissertation.

First, MARKSTRAT is typically played by teams of players and thus lends itself well to testing a framework that deals mostly with team performance. The behaviors of interest in this project--effort, task interaction, conflict, performance, and cohesiveness--are meaningful within this context. Thus, MARKSTRAT allowed to test all the relationships between the processes and outcomes of interest in this project.

Second, this game also led itself well to testing many of the relationships linked to team composition. Although MARKSTRAT is a marketing strategy game and thus focuses mostly on one functional area--marketing--, it requires expertise in multiple domains, beyond the typical marketing management functions. Decisions explicitly cover the following functional areas: production, R&D, and finance. As a consequence, the presence in the team of the different functions can affect performance in the game. MARKSTRAT also does not make roles in the team explicit. The fact that roles are not specified means that team size can vary: there is no fixed number of players per team. It also means that role differentiation occurs as a function of team composition. Consequently, the key dimensions of team

composition--team size and diversity--were expected to vary within the MARKSTRAT context, thus allowing one to test the effects of these constructs on team processes.

Description of MARKSTRAT. MARKSTRAT is a marketing strategy simulation game developed by Larreche and Gatignon (1977). Its purpose is to represent the types of decisions faced by marketing managers for the development of long term strategies. For this purpose, Larreche and Gatignon (1977) have created an environment where five companies compete for market share within an industry. Each company is represented by a team. At the beginning of the game (period 0), each company markets two brands. The game is played over ten periods, each period representing one year. For a given period, each company has to make a number of decisions and handle a decision sheet to the game administrator. Based on these decisions, a computer simulation is run and feedback is given to each company on their performance for the given period. Team performance is estimated as Net Marketing Contribution (total revenue from sales minus: cost of goods sold, inventory holding costs, and R&D, advertising, sales force, and marketing research expenditures). Feedback also indicates the relative market share obtained in each market where the company is present and thus makes it clear that the five companies are in direct competition with one another in

these markets: team performance is directly affected by performance of the other companies in the industry. Thus, the game explicitly incorporates a degree of inter-team competition.

Behaviors in a simulation game. Simulation games are developed to map to companies' reality and allow managers or future managers to experiment with some concepts and approaches at a low cost. The simulated nature of these games allows for trial and error approaches. Participants can make decisions without fear of the consequences. Clearly, this characteristic is at the same time a strength and a weakness. The advantage is that the games allow teams to change factors that are usually quite stable in companies. For instance, in this study, the simulation game allows varying the composition of the teams.

The main concern with simulation games is that participants behave differently than in reality. Two domains are quite likely to be affected: the decisions made, and the level of motivation of the participants. First, the decisions made within the context of the game might differ from the ones made in a real life context. For instance, the fact that the game holds no risk for the participants, because it is only a simulation, means that they can tend to be more risk-prone in their decisions. The decisions could also differ on other dimensions such as

quality. This is an important limitation of the study because the decisions made affect directly the performance results.

The second difference concerns the level of motivation of the participants. Again, the simulated nature of the game fails to generate the level of motivation likely to be found in companies. Because the only incentives in the game are learning and obtaining a grade for the game, involvement is likely to be lower than in a real project. This lower motivation can affect the validity of the results found with regard to effort. In sum, both of these likely differences in behavior are limitations of this study and could jeopardize the mundane realism of the relationships uncovered.

Environment in simulation games. Simulation games are designed to be an abstraction of a real environment, so that many of the characteristics of the environment are either held constant or not taken into account in the game. For instance, although MARKSTRAT attempts to represent fairly accurately the environment in terms of market conditions, its purpose is not to incorporate environmental factors such as organizational culture. Again, this characteristic of simulation games is both an asset and a liability.

In general, this characteristic is an asset for this study, because this abstraction from a real environment provides control over the constructs studied. The sterilized environment used in MARKSTRAT limits the chances that the effects found in this study are due to or masked by extraneous environmental factors, thus providing a cleaner test of the relationships in the framework than would be possible in industry. In particular, the contrived setting guarantees that all teams involved in the game have equivalent tasks to perform and can be judged on equivalent dimensions. Thus, the use of a simulation game allows one to obtain comparable objective measures of performance across teams. This is a particularly attractive characteristic of the game and a clear advantage over reality. With existing teams, obtaining comparable objective measures of performance appears difficult. Teams rarely perform the same tasks or work on the same schedule and it is usually difficult to find objective indicators of performance that hold for all teams.

However, the abstracted environment does not only have positive effects. Because the framework of team effectiveness developed in the preceding chapter explicitly incorporates some environmental factors, it is necessary to detail which of these factors are affected and in which way. Two sorts of influences of the environment can be

detected, those linked to factors that are part of the MARKSTRAT environment and usually blocked in a given way within the game and those linked to the fact that MARKSTRAT can not include any real background environment.

Due to the set-up of the game, a few factors had to be blocked upon. First, as already mentioned in the description of the game, all the teams were in competition with one another for performance on the game. As a consequence, the interteam reward structure could not be manipulated within this context and was expected to be highly competitive for all the teams. Although having a competitive reward structure is not unrealistic and actually happens in many companies, the game precluded any variation on this factor.

Another limitation due to the set-up of the game is that the students did not expect to work together again with the same team for an extended period of time. From the beginning, it was clear that they would have to work together for the 10 weeks during which the game was played, but not afterwards. Similar situations can be found in companies. For instance, many teams are constituted for the purpose of a specific project and cease to exist once the project is completed. New product development teams for instance are often dismantled once the product has been marketed, i.e., once the objectives of the team have been

reached. Thus, this constraint of the game does not affect the mundane realism of the study, but restricts the generalizability of the results. The teams studied had a limited life expectancy and the date of their separation was known from the outset. As a consequence, the results obtained in this study will not be generalizable to other types of teams, such as teams that have an unlimited or unknown life expectancy.

A few factors were also affected by the fact that a simulation game cannot incorporate the external world. Previous research has shown that team performance depends to a large extent on interactions with entities outside the team (departments, top management, etc., cf., Ancona 1990). These interactions could not be included in the game environment, which limited the validity of the study. Another important limitation that can jeopardize the validity of the results is that the game participants had no opportunity to exhibit the commitment to functional departments typically found in cross-functional teams. Thus, even though we could expect participants to be committed to their functional area of expertise in terms of knowledge and values, the additional commitment to departments could not be reproduced in a simulation game context. There was neither history nor perspective of interaction between departments.

Similarly, the duality of structure usually present in cross-functional teams could only be reproduced to a weak extent and with little variation. In effect, participants in a game, just as is the case for managers in industry, have to juggle multiple commitments to which they can allocate effort. For instance, students not only had to work on the simulation game but also on other classes and on other assignments within the class. Thus, they had to allocate their time and effort to multiple projects simultaneously, which reproduced a dual structure. This also holds for the duality of rewards, where rewards based on performance stemmed from multiple sources. However, this only covered a minor part of what a duality of structure implies. Most of the concerns with dual structures are with intangible rewards such as promotion and recognition in the company, rather than solely tangible rewards.

Sample

The participants to this study were 89 MBA students enrolled in two marketing strategy classes at a major Southwestern university. There was no random assignment to teams: students self-selected themselves into teams at the beginning of the semester. Both classes were taught in

parallel by the same instructor and had similar students. Two industries were run in each class, thus yielding a total of 20 teams.

For the administration of the questionnaire, special precautions were taken to ensure collaboration from the students. Students were promised an invitation to beer and pizza at the end of the class as a reward for responding to the survey. The final class grade was also made contingent upon completion of the questionnaire. As a consequence, all but one questionnaire were completed, thus yielding a 98.9% response rate, and from the 88 returned questionnaires, all but one were usable (one respondent did not fill in most of the scales). Thus, a total of 87 usable questionnaires was obtained.

Sample characteristics. The MBA students participating in this study were on average 28.9 years old, with ages ranging from 24 to 41. 63.5% of the students were male, 36.5 female. A variety of majors were present in the sample. The two main ones were marketing (39.5% of the sample) and finance (24.4%). Also represented were production, strategy, accounting, entrepreneurship, international business, management science, general management, and entertainment. This variety was particularly important because functional diversity was one of the inputs of interest in the framework.

It is important to realize that MBA students differ in important ways from actual managers. Some of these differences can affect the validity of the study. An important concern is that MBA programs are explicitly designed to homogenize a population of former managers from different functional areas. Consequently, variation in terms of actual knowledge and values can be expected to be much smaller within a group of MBA students than in an actual cross-functional team in industry. Thus, even though the sample appeared to have a variety of functional areas represented, the differences between these areas might have been smaller than in reality. Similarly, differences in status were expected to be much lower in this sample than in actual teams. Indeed, within student groups, differences in status stem from individual factors, such as ability, grades, or leadership qualities, rather than from organizational ones such as status due to the membership to a prominent department or status due to the hierarchical position of the team members present in the team. These differences were not however deemed to be a major limitation of the study. Limited variation on diversity implied that the tests concerning diversity had lower power in this study than would be the case in reality. As a consequence, any significant results found with such a low power test should be particularly

impressive and we would expect these results to hold even more in actual teams where the variations are greater.

Conclusion. In sum, the characteristics of MARKSTRAT and those of the sample of students playing this game allowed to test parts of the framework developed in the previous chapter, but not every part of the framework. Specifically, this context allowed one to test the relationships between the team processes--effort, task interaction, and conflict--and the outcomes--performance and cohesiveness--of interest in this framework. Particularly attractive was the fact that this context yielded objective measures of performance that were comparable across teams.

Team composition also varied across teams and its effect on team processes could be tested. Team size and diversity of skills and values varied across teams. Diversity of status however was expected to vary to a very small degree.

The most attractive feature of this study is that it allowed one to actually manipulate the intrateam reward structure and thus to have quasi-experimental control over this factor. The duality of structure was also expected to vary in this context, although to a limited degree. The other two reward structure factors were expected to be constant: the overall level of support for teams was

constant and the interteam structure was competitive for all teams.

Finally, the task environment was held constant across all teams. The tasks to be performed were equivalent across teams and their level of interdependence, difficulty, and ambiguity should have been equivalent across teams. It is important to note however, that these constructs, although objectively equivalent across teams, could be perceived differently by different individuals. Thus, all these constructs were measured and the effects of these perceptions investigated.

Data Collection and Study Design

The questionnaire was administered to the students close to the last period of the game, after the teams had worked together for a whole semester. This late date ensured that the students had worked long enough together to be able to report on the behaviors in their team. A better strategy would have been to assess the setting in the first part of the semester and the actual behaviors at the end of the semester. However, this strategy proved impractical.

MARKSTRAT has multiple starting configurations. In this study, all the teams had the same starting position,

i.e., all teams started with 20% market share in each of the two markets in which they were present. The events introduced in the game affected the teams randomly and did not hurt any particular position. Thus, these events introduced some amount of random noise in the data, which might have reduced the effects of the variables of interest, but should not have affected the performance results in any systematic way.

The reward structure was manipulated in this study, using the fact that the study was run in two separate classes. In the first class, the instructor told the students at the beginning of the semester that their individual grade for the game would be the team's grade, i.e., every team member would receive the same grade regardless of their relative contribution to team performance. In contrast, students in the second class were told that their individual grade would be the team grade adjusted for individual contribution. Students were told that if their teammates reported that they did not deserve 100% of the team grade, their individual grade would be the percentage of the team grade that their teammates thought they deserved. By explicitly incorporating individual accountability in the reward structure, the level of competitiveness was increased (Rosenbaum et al. 1980). Thus, the reward structure was

designed to be more competitive in the second class than in the first one. The instructor, unaware of the study's specific hypotheses, arbitrarily assigned these two types of reward structures to the two classes at the beginning of the semester. The manipulation of this factor created a quasi-experimental set-up for this study.

Measures

Two types of data were collected for this study. First, the game administrator provided objective measures of performance for each team. This measure was the net marketing contribution (total revenue from sales minus: cost of goods sold, inventory holding costs, and expenditures for R&D, advertising, sales force, and marketing research) obtained by the teams in the last period of the game. Importantly, this measure of performance was obtained at the team-level.

The other constructs of interest in the framework were measured in the questionnaire survey administered to the students (Appendix A). Because measures for the constructs were not readily available in the literature, ad-hoc measures were developed for this survey. Thus, constructs were measured at the individual-level.

Development of the Survey Instrument

The questionnaire was developed through a succession of exploratory interviews, scale development, pre-test, and scale refinement. A number of formal and informal interviews with managers involved in diverse ways in cross-functional teams were conducted. These managers represented a variety of companies involved in different domains of activity (high technology, insurance, agricultural equipment, etc.) and a variety of cross-functional teams (new product development teams, manufacturing teams). Their involvement in cross-functional teams also varied considerably (team members, team managers, human resource managers, CEOs). These interviews brought a good range of insights and perspectives about the issues involved in designing cross-functional teams and were useful in operationalizing measures for the constructs in the study. The questionnaire items were developed on the basis of these interviews and of previous research.

The core of the questionnaire consisted of Likert-type items measuring perceptions about a number of constructs. Particular care was taken to have the operationalizations of the constructs be adapted to the environment studied, i.e., MARKSTRAT simulation game. For each construct, an

average of 5 Likert-type items were generated. Items were on a five-point scale, anchored by (1) totally disagree and (5) totally agree. These items were submitted to a pretest in May 1993. For this pretest, the questionnaire was administered to the same MBA students during the second week (period) of the game. On the basis of this pretest, reliability scores (Cronbach's alphas) were computed for each construct. In each case, items were dropped or modified to obtain satisfactory reliability coefficients for the constructs measured. In general, the coefficients obtained were quite satisfactory, although some constructs (especially reward structures) appeared quite difficult to measure reliably. The procedure to select and drop items followed closely Churchill's (1979) instructions for scale development. The modified scale items were then mixed and randomized and formed the basis for the final questionnaire.

Constructs Measured

Reliability coefficients were computed for each construct at the individual level. In general, satisfactory reliability coefficients were obtained for this questionnaire. A few constructs however appeared difficult to measure reliably and we had to content

ourselves with two items measuring these constructs. In these cases, the reliability coefficients were estimated through simple correlation coefficients. Based on satisfactory reliability coefficients, the items indicating each construct were averaged, thus creating a composite measure for each construct. The mean obtained by each team on these constructs was then computed and a new data set based on team-level measures was constituted. Appendix B reports in detail the individual-level reliability coefficients and specific items used, as well as the team-level means and standard deviations for each construct.

Outcomes. Respondents were asked to evaluate their performance on the simulation game. Performance was measured by four items ($\alpha = .79$). As mentioned earlier, objective measures of performance (net marketing performance) also served as indicators of performance.

Team cohesiveness was measured by three items ($\alpha = .93$). This construct was operationalized by assessing the extent to which respondents would like working with the same team on future projects.

Team processes. Perceptions of effort were measured through four items ($\alpha = .76$). These items tapped both individual and team effort.

Task interaction was measured through three items ($\alpha = .86$). These items were assessing the extent to which decisions were made collectively within the teams.

Conflict was measured by three items ($\alpha = .72$) tapping the extent to which the teams had had arguments when playing the game. These items focused on conflicts based on the content of the game rather than personality or procedural conflicts.

Team composition. Team size was assessed directly by asking the respondents how many people were in their team.

In line with previous research, diversity was assessed through a measure of functional diversity. Students were asked to write down their area of concentration (major) within the MBA program. Because this question yielded a qualitative variable measured at the individual level, functional diversity within each team was computed following the formula recommended by Ancona and Caldwell (1992): $H = - \sum P_i (\ln P_i)$, where P_i was the fractional share of team members assigned to the team from major i . This measure yields greater values as diversity within the team increases. For instance teams exclusively constituted of marketing majors received a lower score on that variable than teams with a variety of majors. Note that this construct was measured at the team level. Note also that

no special measures were developed for diversity in skills, orientations, and status for this study.

Task characteristics. Task interdependence was assessed through five items ($\alpha = .64$), measuring the extent to which success on the game required that the team members work closely together and shared expertise in a variety of domains.

The difficulty of the task was assessed through five items ($\alpha = .80$). These items assessed the extent to which the game was perceived as a difficult task by the respondents.

Task ambiguity was not specifically measured in this study.

Reward structures. Three items served as indicators of the competitiveness of the intrateam reward structure ($\alpha = .55$). This construct appeared quite difficult to measure, which is reflected in the low reliability coefficient obtained.

Within the MARKSTRAT context, the duality of resources could only be operationalized with time as a resource (money, promotion, etc. are irrelevant in that context). As a consequence, the duality of resources measure focused on the problems encountered for allocating time to the game because of other time commitments. This measure assessed the extent to which respondents had other commitments that

made it difficult for them to allocate time to the game.

This variable was measured through six items ($\alpha = .80$).

CHAPTER 5

MARKSTRAT STUDY: ANALYSES AND RESULTS

This chapter examines the analyses and results of the MARKSTRAT study. First, I describe in detail these results. Then, I discuss both the implications of these results and the limitations of the study.

Because the framework developed in Chapter 3 addresses team-level relationships, I conducted all the analyses at the team level. Thus, the averages obtained by each team on the different constructs described in the preceding chapter were used in these analyses. Because the sample size precluded multivariate analyses at the team level, I conducted bivariate analyses to test the relationships of the framework. Except when otherwise mentioned, an alpha level of .10 was retained for all statistical tests.

Results

Manipulation Check

Based on the instructions given to the students at the beginning of the semester, the reward structure was

expected to be perceived as more cooperative in the first class than in the second. Indeed, a significant difference was found between the means obtained on perceived cooperativeness of the reward structure in the two classes ($t = 2.13$, $p < .036$). Students in the first class tended to find the reward structure to be more cooperative ($m = 3.86$) than students in the second class ($m = 3.49$). This manipulation check thus indicated that the manipulation of intrateam reward structure was successful in this study.

Descriptive Statistics

In this section, descriptive statistics about the teams surveyed are presented. These descriptions are based on the means obtained across teams for each construct. Except when otherwise mentioned, all the constructs in this study were measured on 5-point scales anchored by (1) totally disagree and (5) totally agree. Thus, the mid-point for these scales was 3.

The teams surveyed reported above average performance ($m = 3.90$) as well as team cohesiveness ($m = 4.10$). For the team processes, these teams reported slightly above average levels of effort ($m = 3.51$) and of task interaction ($m = 3.92$) and average levels of conflict ($m = 2.94$). For the design factors, task interdependence and duality of

structure were slightly above average ($m = 3.75$ and $m = 3.38$, respectively), whereas task difficulty was about average ($m = 2.97$).

Relationships Between Team Outcomes

To test Proposition 1, I computed correlation coefficients between the two measures of performance and team cohesiveness. Both measures of performance were significantly correlated with one another ($r = .65$, $p < .001$). Performance also appeared significantly related to team cohesiveness ($r = .44$, $p < .05$ for perceived performance and $r = .47$, $p < .004$ for net marketing contribution). Thus, these results indicate a significant relationship between performance and team cohesiveness, thereby giving support to Proposition 1.

Effects of Process Variables on Outcomes

The first set of analyses concerned the relationships between the mediating variables (effort, task interaction, and conflict) and the two dependent constructs measured in this study, performance and team cohesiveness. These results are reported in Table 1.

Table 1
Effects of Team Processes on Team Outcomes

	Dependent variables		
	Performance		Team cohesiveness
	Perceived	NMC	
Effort	.37	.01	.31
Task interaction	.57 **	.40 *	.39 *
Conflict	-.07	-.01	-.20

Note: ** $p < .05$; * $p < .10$

Both perceived performance and the objective measure of performance (Net Marketing Contribution or NMC) were found to be positively related to task interaction ($r = .57$, $p < .009$ and $r = .40$, $p < .08$, respectively). These findings provide support for Proposition 3a. However, I found no effects of conflict or effort on performance.

Because a curvilinear relationship between conflict and performance had been hypothesized, correlation analyses of the quadratic component for conflict were run with each performance measure. No significant effect of this component was found ($r = -.09$, $p = .70$ for perceived performance and $r = -.04$, $p = .88$ for NMC).

Team cohesiveness was found to increase as task interaction increased ($r = .39$, $p < .09$). This result provides support for Proposition 3b.

Effects of Team Design Factors on Team Processes

The second set of relationships tested consisted of the effects of three categories of design factors on team processes. Table 2 reports these results.

Table 2
Effects of Team Design Factors on Team Processes

	Dependent variables		
	Effort	Task Interaction	Conflict
Team size	-.47 **	-.003	.10
Functional diversity	-.10	.41 *	.14
Task interdependence	.59 **	.63 **	.30
Task difficulty	.05	.29	-.32
Duality	-.04	-.41 *	.09

Note: ** $p < .05$; * $p < .10$

Effort was significantly related to team size and task interdependence. Consistent with Proposition 5, effort significantly diminished when team size increased ($r = -.47$, $p < .04$). Effort also increased with task interdependence ($r = .59$, $p < .006$), which was not hypothesized. Correlation analyses of effort with the quadratic term for task difficulty did not yield any significant result ($r = .03$, $p = .90$). Thus, no evidence for a curvilinear relationship between difficulty and effort was found, contrary to Proposition 10.

Correlation analyses with task interaction showed relationships with functional diversity, task interdependence, and duality of resources. Functional diversity led to increased task interaction ($r = .41$, $p < .07$). Task interdependence also affected task interaction. As the task was perceived to be increasingly interdependent, the level of task interaction within the team increased ($r = .63$, $p < .003$), as predicted in Proposition 9a. Finally, and as predicted in Proposition 15b, duality of resources hindered task interaction ($r = -.41$, $p < .07$). Thus, team members showed a tendency to interact less with one another when their commitments besides the game make it difficult for them to meet as a team.

Conflict was not found to be related to any of the design factors in the study.

Finally, I conducted t-test analyses on the three team processes for each class. These analyses indicated that the two classes did not significantly differ on effort ($t = .48$, $p = .63$), task interaction ($t = .27$, $p = .79$), or conflict ($t = .39$, $p = .70$). Because the intrateam reward structure was manipulated in each class, this signifies that the intrateam reward structure did not affect the three team processes considered.

Discussion

This study was designed as an extended pretest of the main study to be realized in industry. As was mentioned in the preceding chapter, this study only allowed one to test parts of the framework developed in Chapter 3 and the situation did not allow for testing some of the relationships of interest in this framework, such as commitment to functional areas, etc. Nevertheless, this study was helpful in identifying some of the issues at hand when administering and analyzing such a survey. It also yielded support to some of the propositions developed in Chapter 3. The lessons learned through this pretest were integrated in the design of the main study with actual teams. In this section, these lessons (both positive and negative) will be detailed for each part of the framework.

Team outcomes and processes. This study failed to provide strong support for the propositions concerning team processes and team outcomes. As predicted, task interaction was found to influence positively team cohesiveness and team performance. The other two predictors however did not have any effects on either dependent variables. This lack of results could be due to a bias inherent to the game setting. One characteristic of MARKSTRAT is that performance on the game is strongly

affected by the first few decisions. An advantage obtained at the beginning of the game could carry throughout the game. Reciprocally, it can be difficult to make up for poor decisions made at the beginning of the game. As a consequence, team processes might not always be positively related to performance. The teams who are in the best situation after the first few periods can diminish their effort and still obtain a good performance, whereas the teams who start poorly have to increase their effort and might still not make up for their poor start and thus have a poor final performance. This limitation of the game makes it difficult to draw conclusions from the results obtained in this study.

Team design effects. As mentioned earlier, the main focus of this project was to examine the effects of design factors, i.e., of factors on which a team manager has control when designing a team. This study provides insights into how these factors work. The results on team composition were encouraging. First, as hypothesized, team size was shown to have a negative impact on effort. Second, functional diversity was shown to facilitate task interaction, which could be consistent with Proposition 6b. However, one problem with this study is that the operationalization of functional diversity did not allow for distinguishing between the different facets of

diversity. Thus, these results indicated the need for creating specific measures for diversity in skills, orientations, and status for the next study.

The relationships uncovered for task characteristics are also interesting. First, task interdependence was found to lead to greater effort and task interaction. The relationship with effort was unexpected. One explanation for this effect is that the need to work closely together generates a social pressure to exert more effort. Members who would otherwise slack might be forced to attend meetings and thus exert more effort. Second, contrarily to Proposition 10, task difficulty did not have any effect on effort. Thus, this study suggests that tasks should be designed so that they are perceived as interdependent by team members. Note that no measures of task ambiguity were included in this study, which will be addressed in the following study.

Finally, the effects of reward structures appeared quite limited in this study. Although the results on task interaction indicated some support for the effects of dual structures, no effects of intrateam reward structures were found. This was especially disappointing because this study was designed to manipulate this factor. The manipulation appears to have been too weak. Indeed, although this manipulation appeared successful, the

difference between the two classes was quite small (3.86 and 3.49 on a 5-point scale). The amount of individual rewards introduced through the instructions remained fairly minor and could only apply to teams with problems. Because the individual rewards only came into play when teammates complained about one's performance, in most cases, the reward structure was in fact cooperative and individual grades entirely based on team grade.

Overall, even though this study had some clear limitations, a number of the hypothesized relationships were found to hold in the simulation game environment. Because this environment imposed many constraints on the range of variation of a number of constructs included in the study, the fact that any propositions were supported was quite encouraging. For instance, team size in this study only varied between 3 and 6 members. Similarly, task characteristics only varied in how they were perceived, but were objectively similar for all teams. Differences on these and other factors should be much greater in actual cross-functional teams, which should make their effects even stronger.

CHAPTER 6

INDUSTRY STUDY: DESIGN AND METHODOLOGY

The main study for this dissertation consisted of an empirical test of the framework developed in Chapter 3 with actual teams in industry. As explained in Chapter 4, such a test appeared essential for testing the realism of the framework proposed. Compared to the MARKSTRAT study, this study offered a greater mundane realism and also allowed to test all the relationships in the framework. The insights gained from the MARKSTRAT study were used in the development of this study. Special care was taken to ensure that the faulty elements of the first study were improved upon in this study.

This chapter describes the study design and data collection procedures, the characteristics of the final sample, and the measures used.

Data Collection and Study Design

Companies were contacted and asked to participate in a survey of cross-functional teams. A two-page description of the main objectives of the survey was provided to these

companies. This document also included a brief description of the advantages of participating in the survey.

Participating companies were promised a detailed report and a comparison of their teams with those of the rest of the sample. Companies contacted were asked to provide the researchers with the names and addresses of all team members and of one team supervisor for all the teams they wanted to have surveyed. Thus, teams and their composition were identified by the contact within the company. The only requirement we imposed on participating companies was that these teams should be cross-functional (a definition of cross-functional teams was included in the description of the study) and that the marketing function had to be represented in these teams.

Obtaining participation to the study proved difficult as the requirements were quite taxing for companies. Even interested companies seemed to have difficulties identifying teams, team members, and team supervisors. Eventually, three companies provided data for this study. All companies participating were guaranteed confidentiality: they specifically asked not to be identified by name in any documents that would be published about this survey. Thus, these companies will be identified in this dissertation as Company 1, 2, and 3.

Two questionnaires were created for this survey.

First, a questionnaire measuring all the constructs in the framework was developed for team members. Second, a separate questionnaire was developed for team supervisors to assess team performance. Indeed, one concern with this study is that performance across teams could not be compared on objective criteria. In contrast to the MARKSTRAT study, where all teams performed the same task and objective comparable could be obtained as a outcome of the game, such measures were not available with actual teams. The teams surveyed were performing very different tasks, had a variety of objectives, and were not working on the same schedules. Thus, objective measures of performance would not have been comparable across teams. As a consequence, subjective performance measures were obtained from team supervisors, i.e., from a person outside of the team who was in a position to evaluate how well the team was doing.

The procedure for administering the questionnaires varied slightly by company. In Company 1, the questionnaires were distributed to the respondents through internal mail, which we hoped would improve the credibility and thus enhance the response rate to the survey. In Company 2, such a procedure was impossible and the questionnaires were directly mailed from the University to

the team members. Finally, Company 3 proposed to provide rewards for participating in the study. Before mailing the questionnaire, a brief meeting between each of the team leaders and me was arranged. During these meetings, I explained the purpose of the survey to the team leaders and informed them that they would receive their own questionnaires as well as the questionnaires for each member of their team within a week. Thus, in that company the questionnaires were distributed directly by the team leaders to members of their team (in closed envelopes). Participants were informed that they would receive \$25 in merchandise from the mall for returning their completed questionnaires to the researchers. Team leaders were offered the same incentive and were also told that they would receive an additional \$100 in merchandise if all members of their team returned their questionnaire. This incentive was expected to yield a greater return for Company 3 than for either of the other ones. There is however no reason to believe that these changes could have affected the results in any way beyond affecting response rates.

For all the teams surveyed, I enclosed with the questionnaire a cover letter explaining the overall purpose of the survey and guaranteeing anonymity to the respondents (Appendix C). This cover letter also stated very clearly

which team was surveyed, so that members of multiple teams knew perfectly which team the questionnaire was referring to. Also enclosed was a pre-stamped envelope addressed at my name so that all questionnaires were returned directly to the University. Finally, for each company surveyed, a follow-up letter was sent to all non-respondents about 6 weeks after the first mailing.

Sample

Overall characteristics. The three companies provided access to a total of 17 teams. Members from 15 of these teams responded to the survey. Out of 160 team member questionnaires mailed to members of each of these teams, 83 usable questionnaires were received, for a 51.9% response rate. Because Company 2--which provided four teams--failed to provide the names of team supervisors, only 13 team supervisor questionnaires were sent. Of these 13, 7 were returned, for a return rate of 53.9%.

Overall, the average respondent had 18.5 years of professional experience and had been working in the same company for 11.3 years. The sample was 52% female, 48% male. Team size varied from 4 to 29 members, with an average of 12.5 members. Finally, the teams surveyed had been in place for an average of 1.6 years and were expected

to remain in place for an average of 3.1 years. Late respondents did not significantly differ from early respondents on any of these characteristics.

Description by company. Of the three companies that accepted to participate in the study, one was involved in health care and two in retailing. Company 1 is a national health care provider. This company provided access to eight teams. Half of these teams were still in action when the survey was administered, half had been discontinued within three months of the administration of the survey. Of ninety member questionnaires sent within this company, fifty-five were returned (61.1% response rate). Four supervisor questionnaires were returned out of eight (50% response rate). The average team size in that company was 12.4 members. The proportion of males and females was similar to the overall sample (57% female) and the number of years of experience and number of years within the company were of 18.1 and 10.6 years respectively.

Company 2 is a retailer with department stores across the country. This company gave access to teams located at its headquarters. Four teams were surveyed, but no responses were received from one of the teams surveyed. As mentioned earlier, this company did not communicate names of supervisors. Of 23 team member questionnaires sent, 12 were returned (52.2% response rate). The size of the

teams surveyed in that company was similar to the rest of the sample (15 members). However, respondents from this company differed quite markedly from the rest of the sample on other characteristics. These teams had an over-representation of males over females (81% of the respondents were male). Team members were also significantly older than in the other companies (24.8 years of professional experience and 20.8 years in the company in average). These numbers suggest that the teams surveyed in that company were at a much higher hierarchical level than in the other companies. These teams had also been in place for a longer period, 3.3 years in average.

Finally, Company 3 is a local mall. This mall provided access to five teams, but only respondents from four of these teams returned their questionnaires. These teams are constituted of members originating from different stores within the mall and were created by the mall. This creates an extreme in terms of duality of structure because mall management has no direct control over its stores. Indeed, even though the mall was offering tangible rewards for responding to the survey, the response rate in this company was quite low: of 47 member questionnaires sent, 17 were returned (36.2% response rate). The response rate for team supervisors was higher, with 3 supervisor questionnaires out of five returned (60% response rate).

Although the proportion of males to females in these teams was similar to the rest of the sample (60% female), teams were somewhat smaller (8.1 members in average), had less experience (15 years overall, 7 years with the company), and had been created more recently (less than a year).

Measures

This section describes the procedure followed to develop measures for the survey and the specific items used.

The Questionnaire: Development and Test of Scales

The scales used in this survey were developed on the basis of the preceding study. Thus, as often as possible, the items developed for the MARKSTRAT study were used in the questionnaire. However, some items had to be adapted because they were too specific to a simulation game and thus could not be used in another context. New items were also created for constructs that were not measured in the MARKSTRAT study, namely, diversity in orientations and in status and task ambiguity.

For each construct, about 3 items were used in the final questionnaire. To develop the final questionnaire,

two separate pretests were realized. First, the list of the constructs, their definition, and the items designed as indicators of these constructs were presented to three academic researchers. These individuals thus provided expert feedback on scale development and were asked to make sure that the items were indicators of the constructs they were supposed to measure. Thus these experts checked for the face validity of the items generated. On the basis of their feedback, some items were modified and the overall format was modified to accommodate more objective items instead of simply Likert-type items.

The second pretest was realized with managers in one of the companies surveyed. These managers were asked to fill in the final questionnaire (items randomized in the questionnaire) and to give their impressions on the overall questionnaire. Their instructions were explicitly to provide feedback on items that were not clearly written or could be interpreted in multiple ways. On the basis of their feedback, the questionnaire was again slightly modified to ensure that all the items were understood by the respondents.

Constructs Measured

Similarly to what was done with the MARKSTRAT study, questionnaires were administered at the individual level. In addition, two separate questionnaires were generated. The team member questionnaire (Appendix C) closely mirrored the one used in the preceding study, although with some significant adaptations to ensure suitability to an organizational environment and also to take advantage of the fact that all the constructs in the framework could be expected to vary in this study. The second questionnaire was administered to team supervisors only and was expected to provide a more objective estimate of team performance. Thus, the answers given by the team supervisors about a given team were automatically considered as team level variables: supervisors were not asked to evaluate individual performance within the team, only to judge the overall team. The items used in this supervisor questionnaire exactly matched the ones for the team member questionnaires. The only change was in the pronouns used (for instance, the item "Overall, our team is performing well" became "overall, this team is performing well").

Reliability coefficients were computed for each construct at the individual level. In general, satisfactory reliability coefficients were obtained for

this questionnaire, with Cronbach's alphas ranging from .65 to .87. A few constructs however appeared difficult to measure reliably and we had to content ourselves with two items measuring these constructs. In these cases, the reliability coefficients were estimated through simple correlation coefficients. For each construct, the items measuring the construct were averaged, thus creating a composite measure for each construct. The mean obtained by each team on these constructs was then computed and a new data set based on team-level measures was constituted. Appendix D reports in detail the individual-level reliability coefficients and specific items used, as well as the team-level means and standard deviations for each construct. Except when otherwise specified, all items were measured on 7-point scales anchored by totally disagree and totally agree.

Outcomes. Respondents were asked to evaluate their performance through four items ($\alpha = .78$). Even though an attempt was made to have more direct measures of performance in the questionnaire (percentile measures), these items appeared confusing for the respondents and only half of the respondents actually filled in these questions. As a consequence, these items were not used in the analyses.

Based on supervisor questionnaires, supervisor ratings of performance were also assessed for each team. These ratings were the average of two items matching the team performance measures mentioned above.

Team cohesiveness was measured by three items ($\alpha = .87$). The items used were somewhat more varied than in the previous study and generally tapped overall positive affect towards the team.

Team processes. Perceptions of effort were measured through five items ($\alpha = .80$). Three Likert-type items were used to assess perceived task interaction ($\alpha = .79$). Similarly, conflict was measured through two Likert-type items ($r = .47$).

Team composition. Team size was assessed directly by asking the respondents how many people were in their team. To address the problems found in the preceding study, the different facets of diversity were all measured at the individual level in this questionnaire. Four items served as indicators of duplication of expertise ($\alpha = .69$), three as indicators of diversity in orientations ($\alpha = .67$), and three as indicators of status diversity ($\alpha = .70$).

Task characteristics. Task interdependence was measured through five items ($\alpha = .81$) and task difficulty through four items ($\alpha = .80$). Measures of

task ambiguity were created for this questionnaire. Consistent with the literature, two facets of task ambiguity were measured. Three items served as indicators of role ambiguity ($\alpha = .69$), three of goal ambiguity ($\alpha = .75$).

Reward structures. Support for teams was assessed through four items ($\alpha = .75$). Two of these items were part of the main questionnaire, two were more direct questions concerning the resources received by the team and how much a priority the team is receiving in the company.

Both the intrateam and the interteam reward structures were assessed. The proportion of individual over team rewards in the intrateam structure was assessed with two items ($r = .42$). The competitiveness of the interteam structure was assessed through three items ($\alpha = .60$).

Finally, and similarly to the preceding study, the duality of the reward structure was assessed with four items ($\alpha = .67$).

CHAPTER 7

INDUSTRY STUDY: ANALYSES AND RESULTS

This chapter examines the analyses and results of the study described in Chapter 6. I first describe the results in detail. Then, I discuss both the implications of these results and the limitations of the study.

Similarly to the analyses for the MARKSTRAT study, I conducted all the analyses at the team level. Thus, the averages obtained by each team on the different constructs described in the preceding chapter were used in these analyses. Because the sample size precluded multivariate analyses at the team level, I conducted bivariate analyses to test the relationships of the framework. Except when otherwise specified, alpha levels of .10 (two-tailed) were retained for all statistical tests.

Results

Descriptive Statistics

In this section, descriptive statistics about the teams surveyed are presented. These descriptions are based

on the means obtained across teams for each construct. Except when otherwise mentioned, all the constructs in this study were measured on 7-point scales anchored by (1) totally disagree and (7) totally agree. Thus, the mid-point for these scales was 4.

The teams surveyed reported slightly above average performance ($m = 4.69$ for perceived performance and $m = 4.43$ for supervisor ratings of performance) and relatively high team cohesiveness ($m = 5.32$). For the team processes, these teams reported average effort ($m = 4.58$) and task interaction ($m = 4.38$) and low levels of conflict ($m = 2.81$). Most of the design factors also were close to the mid-point of the scale (see Appendix B for detailed means), with the exception of duplication of expertise ($m = 2.76$) and of the intra- and interteam reward structures, which both appeared to be relatively cooperative ($m = 2.99$ and 2.95 , respectively).

Relationships Between Outcomes

To test Proposition 1, the correlation coefficients between performance and cohesiveness were computed. First, perceived performance was positively related to team cohesiveness ($r = .77$, $p < .0007$). However, supervisor ratings of performance were not correlated with

cohesiveness ($r = .54$, $p = .21$). These supervisor ratings were however related with team members ratings of performance ($r = .89$, $p < .006$). Thus, although support was found for Proposition 1 for team members perceptions of team outcomes, no support was found with team supervisors' ratings.

Effects of Process Variables on Outcomes.

Table 3 reports the results from these analyses.

Table 3
Effects of Team Processes on Team Outcomes

	Dependent variables		
	Performance		Team
Cohesiveness			
	Perceived	Supervisor	
Effort	.92 **	.87 **	.67 **
Task interaction	.86 **	.73 **	.69 **
Conflict	.12	-.002	.005

Note: ** $p < .05$; * $p < .10$

The same pattern of relationships was found for the two measures of performance. Both measures were positively related to effort ($r = .92$, $p < .0001$ for perceived team performance and $r = .87$, $p < .01$ for supervisor ratings of performance), which provides support to Proposition 2a.

Both measures were also positively affected by task interaction ($r = .86$, $p < .001$ for perceived performance and $r = .73$, $p < .06$ for supervisor ratings of performance). Thus, Proposition 3a was supported. No relationships with conflict were found.

Because Proposition 4a suggested a curvilinear relationship between conflict and performance, regressions were run with the quadratic term of conflict. No significant relationships between this term and the two performance measures were found ($r = .08$, $p = .77$ for perceived performance and $r = -.18$, $p = .97$ for supervisor ratings).

Team cohesiveness was found to be related to task interaction and team effort. First, effort and team cohesiveness were found to be positively related ($r = .67$, $p < .006$). This result is consistent with Proposition 2b, which suggested that team members would dislike teams where some members exert less effort. Task-related interactions also led to increased team cohesiveness ($r = .69$, $p < .004$). This finding is consistent with Proposition 3b and with the notion that interaction generates liking.

Effects of Team Design Factors on Team Processes

Table 4 reports the correlation coefficients between team design factors and team processes.

Table 4
Effects of Team Design Factors on Team Processes

	Dependent variables		
	Effort	Task Interaction	Conflict
Team size	.0006	.04	.31
① Skill duplication	-.70 **	-.75 **	-.08
Orientation diversity ✓	.63 **	.58 **	.34
① Status diversity	-.21	-.36	.33
Task interdependence ✓	.81 **	.76 **	.33
Task difficulty ✓	.61 **	.53 **	.07
① Role ambiguity	-.89 **	-.78 **	-.09
① Goal ambiguity	-.76 **	-.71 **	.02
Support	.66 **	.71 **	.33
① Intrateam structure	-.61 **	-.59 **	-.34
Interteam structure	-.37	-.32	-.14
Dual structure	-.18	-.09	-.20

Note: ** $p < .05$; * $p < .10$

Correlation analyses of the team design factors with effort yielded relationships with duplication of skills, diversity in orientations, task interdependence, task difficulty, role and goal ambiguity, team support, and with the intrateam reward structure. As predicted in Proposition 6a, effort diminished when skill duplication increased ($r = -.70$, $p < .004$). More surprisingly, diversity in orientations appeared to lead to increased

effort ($r = .63$, $p < .01$). This result was unexpected. Diversity in orientations was not hypothesized to affect effort, and the direction of this relationship appears difficult to explain. Similarly to what was found in the MARKSTRAT study, task interdependence appeared to encourage effort ($r = .81$, $p < .0002$). The relationship between task difficulty and effort provided support for Proposition 10. Positive relationships between task difficulty and effort ($r = .61$, $p < .02$) and between the quadratic term of task difficulty and effort ($r = .54$, $p < .04$) suggested a curvilinear relationship between these two constructs. In support of Proposition 11a, both role ambiguity and goal ambiguity were found to negatively affect effort ($r = -.89$, $p < .0002$ and $r = -.89$, $p < .0001$, respectively). Finally, two relationships were uncovered between effort and reward structures. First, as hypothesized in Proposition 12, the amount of effort exerted within teams appeared to increase as the degree of organizational support received by the team increased ($r = .66$, $p < .007$). Second, and consistent with Proposition 13a, effort decreased as the proportion of individual rewards over team rewards increased within the team ($r = -.61$, $p < .02$).

The same pattern of results was found for task interaction. Thus, in support of Proposition 6b, skill duplication was found to impair task interaction ($r = -.75$,

$p < .001$). Contrary to what was hypothesized in Proposition 7a, diversity in orientations appeared to encourage task interaction ($r = .58$, $p < .02$). Consistent with Proposition 9a, task interdependence led to increased task interaction ($r = .76$, $p < .001$). More surprisingly, task interaction was found to be positively related to task difficulty ($r = .53$, $p < .04$), which was not hypothesized. As predicted in Proposition 11b, role and goal ambiguity impaired task interaction ($r = -.78$, $p < .0006$ and $r = .71$, $p < .003$, respectively). Finally, task interaction was influenced by the nature of the reward structure. First, and somewhat surprisingly, task interaction increased when the degree of organizational support given to the team increased ($r = .71$, $p < .003$). Second, and in support of Proposition 13b, task interaction decreased as the proportion of individual rewards over team rewards increased within the team ($r = -.59$, $p < .02$).

Conflict was not found to be affected by any of the team design factors included in this study.

Discussion

As detailed in Chapter 6, this study was designed to test the relationships proposed in this dissertation in a realistic framework. Overall, the results obtained through

this survey provided support for many of the relationships hypothesized. In this section, the results and their implications are examined for each area.

Team outcomes and processes. This study generally provided support for the propositions concerning team performance and team cohesiveness. As predicted, team performance and team cohesiveness were related. Interestingly however, supervisors' ratings of performance were not related to team cohesiveness.

The propositions relating team processes and team outcomes generally received support. Thus, both perceived performance and supervisors' ratings of performance appeared positively related to effort and task interaction. Team cohesiveness was also found to be positively related to effort and task interaction. In fact, the only surprising results were the ones with conflict. Contrarily to hypotheses, conflict did not appear to be related to any of the team outcomes.

Team design effects. First, the propositions on team composition received mixed support in this study. The hypothesized effect of team size on effort found in the MARKSTRAT study was not replicated in a more realistic environment. On the other hand, the hypothesized positive effects of skill diversity on effort and task interaction were found. Also, and in sharp contrast to the

hypothesized relationship, diversity in orientations appeared to lead to increased effort and task interaction. These two results run counter to common wisdom and to previous literature and suggest that diversity in orientations might not be as much of a problem as previously thought. Overall, these results suggest that team managers should design teams with both skill and orientation diversity.

The propositions on task characteristics received strong support in this study. Except for the relationships with conflict, all of the hypothesized relationships between task characteristics and effort and task interaction were supported. In fact, task interdependence also appeared to help effort and task difficulty to facilitate task interaction, which was not hypothesized. Overall, these results suggest that team managers should stress interdependence of the tasks to be conducted by the teams, design tasks with moderate levels of difficulty, and make both roles within the team and team goals as clear as possible.

Finally, this study suggests interesting effects of reward structures. First, the level of organizational support granted to the team was found to affect effort and more surprisingly task interaction. Second, and in line with the proposed framework, teams with a competitive

intrateam reward structure were found to exert less effort and interacted less than teams with a cooperative structure. No effects of the interteam reward structure or of the duality of structure were found in this study. Overall, these results suggest that reward structures that focus on team outputs are more effective than individual-based structures, and that team managers should make clear that their team is supported by management.

Conclusion. Overall, this study provided relatively strong support for the proposed framework. Although conflict was not found to be affected by any of the design factors included and did not affect any of the team outcomes, results for the other two team processes were quite satisfying. Both effort and task interaction were found to affect team performance and team cohesiveness as expected, and these two processes were in turn found to be affected by many of the design factors included in the framework. Moreover, to the exception of the relationships with diversity in orientations, all the relationships found in this study were in the expected direction.

CHAPTER 8 CONCLUSIONS

The purpose of this dissertation was to propose a general framework of cross-functional team performance applicable to a variety of these teams and yet acknowledging their differences. Given the atheoretical character of previous research on these types of teams, such a framework appears a valuable first step towards a better understanding of the processes at hand in these teams.

Contributions

A major contribution of this dissertation is its focus on small group processes. Although horizontal structures are usually teams, research so far has not fully acknowledged the importance of group processes in the study of these structures. Through the use of social psychological approaches to group processes, this dissertation has identified factors that can be used to make any kind of cross-functional team more effective. Also, because this dissertation integrates literature from

a variety of domains and proposes a broad framework for understanding team effectiveness, it provides a basis for theoretical developments in domains where research has traditionally been more descriptive than theoretical. For instance, researchers in new product development, advertising, and industrial buying and selling could use this framework and adapt it to the specific conditions and problems of their environment. This framework also could help promote theoretical developments for researchers interested in the relationships between marketing and other functional areas (e.g., Ruekert and Walker 1987).

Another major contribution of this dissertation is its focus on team design. Most previous research on team effectiveness has focused on the effects of team processes. In contrast, the framework proposed in this paper focuses on the antecedents of team processes, or design factors. This design approach is a major shift from previous research in that it suggests the need to consider the effects of structural characteristics of the teams on their effectiveness. A key contribution of the proposed framework is to identify key constructs in three major areas of team design--team composition, task characteristics, and reward structures--and to detail the effects of these constructs on team processes. The distinctions proposed between the different facets of

cross-functionality, the dimensions of task characteristics, and the levels of reward structures should help organize the variety of phenomena occurring within teams.

This dissertation also contributes to the literature by testing empirically the hypothesized relationships in two complementary studies, one focusing on control, the other on realism. The empirical results found in these studies can be of direct use to managers involved in cross-functional teams.

Limitations and Future Research

A major limitation of this dissertation was the low sample sizes in both studies. These low sample sizes seriously restricted the power of the analyses. They also precluded any multivariate analyses at the team level for these studies.

Further theoretical developments based on this dissertation could take two main directions: (1) identifying boundary conditions to the relationships and (2) investigating specific relationships in more depth. Because the framework is not context-specific, applying it to specific contexts certainly would help refine it and find boundary conditions for the propositions developed.

For instance, researchers in the new product development area could develop theories about how relationships might change over the different phases of the new product development process (Karagozoglu and Brown 1993).

Further theoretical developments also could be obtained by focusing on specific relationships or domains of the framework. Researchers who focus on specific constructs and who use more refined distinctions within these constructs could certainly further specify the propositions in this framework. For instance, researchers interested in reward structures could study the relative effectiveness of different types of rewards (e.g., financial versus non-financial rewards) on the team processes described in the framework.

Conclusion

In conclusion, this dissertation provides marketing managers and researchers with a groundwork for understanding how to make teams more effective. Because team effectiveness is such a vast domain, this dissertation should be viewed as a first step at mapping this domain. Hopefully it will help to motivate marketing researchers to get involved in this exciting, but neglected area of research.

APPENDIX A
QUESTIONNAIRE FOR MARKSTRAT STUDY

Please circle the number indicating your degree of agreement with each statement.

	Totally disagree			Totally agree	
1. Overall, our team did a good job at this game.	1	2	3	4	5
2. We could have gotten more work done with more people in our team.	1	2	3	4	5
3. This game requires to have a well-balanced team.	1	2	3	4	5
4. It was difficult for us to meet because we had other commitments besides this game.	1	2	3	4	5
5. I have put a lot of effort into this game.	1	2	3	4	5
6. In our team, we were going through the analysis for every decision together.	1	2	3	4	5
7. In this game, teams are in competition with one another in an industry.	1	2	3	4	5
8. Everyone in our team had a unique area of expertise.	1	2	3	4	5
9. Some of my teammates have put more time in this game than I have.	1	2	3	4	5
10. We have had many arguments in our team because different people favored different sides.	1	2	3	4	5

	Totally disagree			Totally agree	
11. I had many other commitments besides this game.	1	2	3	4	5
12. It was tough to get everybody in our team to work.	1	2	3	4	5
13. I would be happy to work with this team again.	1	2	3	4	5
14. My grade in the class depends mostly on our performance on this game.	1	2	3	4	5
15. To devise a sound strategy, all elements in the game need to be considered simultaneously.	1	2	3	4	5
16. The grade for this game will be higher for those who worked more than their teammates.	1	2	3	4	5
17. We had too many people in our team.	1	2	3	4	5
18. In this game, teams within an industry have to collaborate with one another.	1	2	3	4	5
19. I have been working harder for this game than some of my teammates.	1	2	3	4	5
20. I found this game to be quite easy.	1	2	3	4	5
21. Good performance on this game requires that the team members work closely together.	1	2	3	4	5
22. Everybody in our team has been working really hard for each decision.	1	2	3	4	5

	Totally disagree			Totally agree	
23. The decisions I have made in this game have been quite good.	1	2	3	4	5
24. Because of other priorities, we could not allocate much time to this game.	1	2	3	4	5
25. We have not had any major disagreements within our team.	1	2	3	4	5
26. Everybody in our team will get the same grade for this game.	1	2	3	4	5
27. If I had to do it again, I would try to work with some other people.	1	2	3	4	5
28. I have not put a lot of time into this game.	1	2	3	4	5
29. Parts of the decisions required in the game were beyond my expertise..	1	2	3	4	5
30. It would have been easier for us to work together if our team had been smaller.	1	2	3	4	5
31. There was a lot of overlap of expertise on our team.	1	2	3	4	5
32. This game represents the major part of my grade in this class.	1	2	3	4	5
33. We disagreed about our marketing strategy within our team.	1	2	3	4	5
34. This game was quite difficult for our team.	1	2	3	4	5

	Totally disagree			Totally agree	
35. I had rather not work with this team again in the future.	1	2	3	4	5
36. In our team, we discussed all the elements for each decision.	1	2	3	4	5
37. There was a lot of slacking off in our team.	1	2	3	4	5
38. We found it hard scheduling meetings together.	1	2	3	4	5
39. In this game, each decision requires to carefully consider all the elements simultaneously.	1	2	3	4	5
40. This game makes it clear that I still have a lot to learn in marketing.	1	2	3	4	5
41. We had very little overlap of expertise within our team.	1	2	3	4	5
42. I have put less effort in this game than some of my teammates.	1	2	3	4	5
43. All the teams in an industry can do well at the same time.	1	2	3	4	5
44. It has been difficult for me to allocate time to this game.	1	2	3	4	5
45. My grade on this game depends only on the performance of our team.	1	2	3	4	5
46. We had too few people in our team.	1	2	3	4	5
47. This game requires close coordination between the different team members.	1	2	3	4	5

	Totally disagree			Totally agree	
48. We had a lot of bargaining in our team.	1	2	3	4	5
49. This game was quite easy for our team.	1	2	3	4	5
50. I have been working as hard as I could for this game.	1	2	3	4	5
51. I did not fully understand some of the elements involved in this game.	1	2	3	4	5
52. When a team performs poorly on this game, the other teams in the industry are better off.	1	2	3	4	5
53. This game only represents a minor portion of my grade in this class.	1	2	3	4	5
54. Our team has no chance to excel in our industry.	1	2	3	4	5
55. We have made most of our decisions together in our team.	1	2	3	4	5
56. If I had to work on such a project again, I would choose to work with the same team.	1	2	3	4	5
57. We did not always understand what was going on in this game.	1	2	3	4	5
58. I have done a good job in this game.	1	2	3	4	5
59. Team members who worked less than their teammates will be penalized in the grading of this game.	1	2	3	4	5
60. I had some other priorities besides this game.	1	2	3	4	5

TEAM WORK

Industry # _____
 Company # _____
 Team size _____ members

In average, I worked on this game about _____ hour(s) a week.
 Out of these, I worked about _____ % of the time by myself
 and _____ % with the team.

Circle the statement that describes your team's work best:

We have been doing:

everything independently
 almost everything independently
 parts independently, parts together
 almost everything together
 everything together

INDIVIDUAL CHARACTERISTICS

Name: _____
 Age: _____ years
 Sex: _____ Male _____ Female
 Major: _____
 GPA: _____

Work experience (3 previous jobs):

Function	Company	Number of years
_____	_____	_____
_____	_____	_____
_____	_____	_____

Describe your main role and task in this team:

APPENDIX B
SCALES FOR MARKSTRAT STUDY

Performance

I have done a good job in this game.

Overall, our team did a good job at this game.

The decisions I have made in this game have been quite good.

Our team has no chance to excel in our industry. *

$\alpha = .79$; $m = 3.90$; $s = .61$

Team cohesiveness

I would be happy to work with this team again.

I had rather not work with this team again in the future. *

If I had to work on such a project again, I would choose to work with the same team.

$\alpha = .93$; $m = 4.10$; $s = .61$

Effort

Everybody in our team has been working really hard for each decision.

I have put a lot of effort in this game.

I have been working as hard as I could for this game.

There was a lot of slacking off in our team. *

$\alpha = .76; m = 3.51; s = .53$

Task interaction

In our team, we were going through the analysis for every decision together.

In our team, we discussed all the elements for each decision.

We have made most decisions together in our team.

$\alpha = .86; m = 3.92; s = .59$

Conflict

We have had many arguments in our team because different people favored different sides.

We disagreed about our marketing strategy within our team.

There was a lot of bargaining in our team.

$\alpha = .72; m = 2.94; s = .62$

Team size

$m = 4.5; s = .59$

Functional diversity

$m = .90; s = .26$

Task interdependence

This game requires to have a well-balanced team.

To devise a sound strategy, all elements in the game need to be considered simultaneously.

Good performance on this game requires that all the members work closely together.

In this game, each decision requires to carefully consider all the elements simultaneously.

This game requires close coordination between the different team members.

$$\alpha = .64; m = 3.75; s = .35$$

Task difficulty

I found this game to be quite easy. *

We did not always understand what was going on in this game.

I did not fully understand some of the elements involved in this game.

This game was quite difficult for our team.

This game was quite easy for our team. *

$$\alpha = .80; m = 2.87; s = .54$$

Intrateam reward structure

Everybody in our team will get the same grade for this game.

My grade on this game depends only on the performance of our team.

Team members who worked less than their teammates will be penalized in the grading of this game.

$$\alpha = .55; \quad m = 3.68; \quad s = .43$$

Duality

I had some other priorities besides this game.

It was difficult for us to meet because we had other commitments besides this game.

It has been difficult for me to allocate time to this game.

Because of other priorities, we could not allocate much time to this game.

I had many other commitments besides this game.

We found it hard scheduling meetings together.

$$\alpha = .80; \quad m = 3.38; \quad s = .38$$

Note: * in this appendix indicates a reversed item.

APPENDIX C
QUESTIONNAIRE FOR INDUSTRY STUDY

Dear Sir/Madam:

Your company has agreed to participate in a study conducted jointly by the University of Florida and by Virginia Polytechnic Institute and State University. The objective of this study is to better understand the factors that lead to cross-functional team effectiveness. This study is sponsored by the Marketing Science Institute, a not-for-profit institution whose objective is to support academic research in the marketing field. Your name and address were communicated to us by your company because you are a member of a cross-functional team of the type included in this study. As part of the study you will be asked to complete the attached questionnaire with respect to the Name of Team of which you are a member. All your responses should be made with this team in mind.

The survey is just asking for your opinions and feelings, and there are no right or wrong answers. Pretests have indicated that you should be able to complete it in about 30 minutes. Our sample is limited and therefore your responses are extremely important to us. All your responses will be kept completely confidential and will not be revealed to your employer. Any information given to your company will be based on responses averaged across respondents and teams so that no one's individual answers can be determined.

Please return your completed questionnaire in the enclosed postage-paid envelope as soon as possible. If you have any questions or concerns about the study, feel free to contact us at the above address or by calling (703) 231-3764. Should you wish to receive a report of the results of this study, please staple your card with your questionnaire and we will mail the report to you. Thank you in advance for your participation, we appreciate your help.

Corinne Faure
Assistant Professor of Marketing
Virginia Tech

Barton A. Weitz
Professor of Marketing
University of Florida

This questionnaire concerns the cross-functional team of which you are a member.
All your responses should be made with this team in mind.

The following statements concern what usually happens in your team.

Please indicate your degree of agreement with each statement by circling the appropriate number.

	Totally disagree				Totally agree		
	1	2	3	4	5	6	7
1. Overall, our team is performing well.	1	2	3	4	5	6	7
2. Everyone in our team has a unique area of expertise.	1	2	3	4	5	6	7
3. I am not putting as much time as I should into this team.	1	2	3	4	5	6	7
4. It is difficult for our team to meet because of our other commitments.	1	2	3	4	5	6	7
5. Every one in our team is working really hard.	1	2	3	4	5	6	7
6. Some people in this team have a lot more status than others.	1	2	3	4	5	6	7
7. We are constantly in conflict in this team.	1	2	3	4	5	6	7
8. I often feel that my expertise is wasted on this team.	1	2	3	4	5	6	7
9. People in this team have very different values.	1	2	3	4	5	6	7
10. There is a lot of duplication of expertise on our team.	1	2	3	4	5	6	7

	Totally disagree				Totally agree		
11. We work very closely together in this team.	1	2	3	4	5	6	7
12. I am a key member of this team.	1	2	3	4	5	6	7
13. I would rather not work with this team again in the future.	1	2	3	4	5	6	7
14. I am putting a lot of effort for this team.	1	2	3	4	5	6	7
15. Everybody in the team puts the team's interests before their own department's interests.	1	2	3	4	5	6	7
16. It is tough to get people in our team to work.	1	2	3	4	5	6	7
17. Different people in our team favor different approaches.	1	2	3	4	5	6	7
18. We all have about the same amount of power within this team.	1	2	3	4	5	6	7
19. Every team member brings some unique skills to the team.	1	2	3	4	5	6	7
20. Our team is moving along well towards its objectives.	1	2	3	4	5	6	7
21. I am working as hard as I can for this team.	1	2	3	4	5	6	7
22. Key decisions are always made in close collaboration with all team members.	1	2	3	4	5	6	7

	Totally disagree				Totally agree		
23. There are only a few tasks for which the team really needs my expertise.	1	2	3	4	5	6	7
24. If I had a choice, I would stop working with this team.	1	2	3	4	5	6	7
25. In general, people in this team have the same view of things.	1	2	3	4	5	6	7
26. I am a top performer in this team.	1	2	3	4	5	6	7
27. There is a lot of slacking off in our team.	1	2	3	4	5	6	7
28. We find it hard scheduling meetings together.	1	2	3	4	5	6	7
29. Everybody in this team is at about the same hierarchical level.	1	2	3	4	5	6	7
30. We have a hard time coming to a consensus when making a decision.	1	2	3	4	5	6	7
31. There are lots of time when my expertise is not necessary for the team.	1	2	3	4	5	6	7
32. I really enjoy working with this team.	1	2	3	4	5	6	7
33. People in this team always try to push the team towards their own department's interests.	1	2	3	4	5	6	7
34. There is a lack of coordination in this team.	1	2	3	4	5	6	7

The following statements concern the environment in which your team has to work. Please indicate your degree of agreement with each statement by circling the appropriate number.

	Totally disagree				Totally agree		
1. Teams are really valued by top management in this company.	1	2	3	4	5	6	7
2. The best performers in our team receive extra recognition.	1	2	3	4	5	6	7
3. Our team competes directly with other teams for access to resources.	1	2	3	4	5	6	7
4. Each team member has clear responsibilities within the team.	1	2	3	4	5	6	7
5. The tasks require that everybody in the team communicate about their work.	1	2	3	4	5	6	7
6. My tasks in this team are quite straightforward.	1	2	3	4	5	6	7
7. We need a multiplicity of skills within the team to accomplish our objectives.	1	2	3	4	5	6	7
8. Our team objectives are clearly stated.	1	2	3	4	5	6	7
9. My rewards on this team are proportional to my contribution to the team's performance.	1	2	3	4	5	6	7
10. Performing well on this team can lead to a lot of recognition in the company.	1	2	3	4	5	6	7
11. All team members are rewarded equally in this team, independently of individual contribution.	1	2	3	4	5	6	7

	Totally disagree				Totally agree		
12. Good team performance requires that the team members work closely together.	1	2	3	4	5	6	7
13. The tasks we have to do in this team are very complex.	1	2	3	4	5	6	7
14. Our team performance is evaluated against that of other teams.	1	2	3	4	5	6	7
15. The tasks we have to do require expertise in multiple domains.	1	2	3	4	5	6	7
16. It is difficult to know who is responsible for what in our team.	1	2	3	4	5	6	7
17. My tasks in this team are quite easy.	1	2	3	4	5	6	7
18. Our team performance is evaluated against known objective criteria.	1	2	3	4	5	6	7
19. Most of the tasks we have to do in this team are routine tasks.	1	2	3	4	5	6	7
20. Most of the company's work is done in departments rather than in teams.	1	2	3	4	5	6	7
21. There are clear ways to assign subtasks to the different team members.	1	2	3	4	5	6	7
22. The tasks we have to do require close coordination between all team members.	1	2	3	4	5	6	7
23. My performance on this team has virtually no effect on my chances for promotion.	1	2	3	4	5	6	7

	Totally disagree				Totally agree			
	1	2	3	4	5	6	7	
24. Our team rewards do not depend on how well the other teams are doing.								
25. This company values teamwork a lot.								
26. It is not clear what our team is supposed to do.								
27. Working on this team improves my chances of being promoted.								
28. The tasks we have to do require a team with a balanced collection of skills.								
29. My assignments in this team are very complex.								

This part of the questionnaire concerns some of the characteristics of your team and of yourself. Remember, your answers will in no way be associated with your name.

Personal characteristics

Name: _____

Company: _____

Sex: _____ Male _____ Female

Number of years of work experience: _____ years

Numbers of years in company: _____ years

What is your department of origin? _____

What percent of your time is supposed to go to:

- this team? _____ %

- other teams? _____ %

- your department? _____ %

Work experience (3 previous jobs):

Function years	Company	Number of
_____	_____	_____
_____	_____	_____
_____	_____	_____

Team characteristics

Describe briefly your team's main function:

Describe briefly your main role in the team:

What priority is given to this team by top management?

(circle the appropriate number)

Low priority 1 2 3 4 5 6 7 Top priority

How would you describe the resources this team receives

from the company? (circle the appropriate number)

Sufficient 1 2 3 4 5 6 7 Insufficient
resources

Check the statement that best represents the way your team was started:

- ___ This team was created spontaneously by some of the team members.
- ___ This team existed as an informal network, and management made it formal after a while.
- ___ This team was created by management.
- ___ Other (specify) _____

Check the statement that best reflects how you started working on this team:

- ___ You were asked by management whether you wanted to work with this team.
- ___ You were asked by some team members whether you wanted to work with this team.
- ___ You were told by management to work with this team.
- ___ You were at the origin of the team.
- ___ You were asked to work on a team, and could choose between different teams.
- ___ Other (specify) _____

Check the statement that best represents how you work in your team:

- ___ We are mostly working independently.
- ___ In general, we work independently and meet regularly to put together our independent contributions.
- ___ We work most of the time together.
- ___ Our work is a balance between independent work and team work.
- ___ Other (specify) _____

Complete the following sentences:

There are ___ people in this team.

There are ___ such teams in this location (including yours).

This team was constituted _____ ago.

This team is expected to be in place for _____ longer.

I have been a member of this team for ___ months.

Last month, we had _ team meetings.

Last month, I spent about ____ hours working by myself for the team.

Last month, I spent about ____ hours in meetings with the team.

In average, I spend about ____ hours a week on tasks related to this team.

In average, I spend about ____ hours a week on tasks unrelated to this team.

In average, I spend about ____ hours a week politicking for our team.

Last month, we had about ____ major conflicts within our team.

Last month, we had about ____ arguments within our team.

I am supposed to spend ____ hours a week working for this team.

I cannot allocate more than ____ hours a week working for this team.

We would do a better job with ____ people in the team.

For the last year, our team fulfilled ____ % of its objectives.

Compared to other team projects conducted in this location within the last year, our team performance was in the ____ th percentile.

Compared to the other team members, my contribution to our team this last year was in the ____ th percentile.

Different departments are represented in your team. Please list the five most important departments for your team in the space below, and give the number of people working on your team from each of these departments.

	Name of department	Number of representatives in team
Your department:	_____	_____
Department # 2:	_____	_____
Department # 3:	_____	_____
Department # 4:	_____	_____
Department # 5:	_____	_____

APPENDIX D
SCALES FOR INDUSTRY STUDY

Performance

I am a top performer in this team.

Overall, our team is performing well.

Our team is moving along well towards its objectives.

I am a key member of this team.

$\alpha = .78; m = 4.69; s = .76$

Team cohesiveness

I would rather not work with this team again in the future. *

If I had a choice, I would stop working with this team. *

I really enjoy working with this team.

$\alpha = .87; m = 5.32; s = .90$

Effort

Everyone in our team is working really hard.

It is tough to get people in our team to work. *

There is a lot of slacking off in our team. *

I am putting a lot of effort for this team.

I am working as hard as I can for this team.

$\alpha = .80; \quad m = 4.58; \quad s = .96$

Task interaction

We work very closely together in this team.

Key decisions are always made in close collaboration with all team members.

There is a lack of coordination in this team. *

$\alpha = .79; \quad m = 4.38; \quad s = 1.07$

Conflict

We are constantly in conflict in this team.

We have a hard time coming to a consensus when making a decision.

$r = .47; \quad m = 2.81; \quad s = .85$

Team size

$m = 12.45; \quad s = 5.70$

Duplication of expertise

Everyone in our team has a unique area of expertise. *

I often feel that my expertise is wasted on this team.

There is a lot of duplication of expertise on our team.

Every team member brings some unique skills to the team. *

$\alpha = .69; \quad m = 2.77; \quad s = .54$

Diversity in orientations

People in this team have very different values.
Different people in our team favor different approaches.
In general, people in this team have the same view of things. *

$$\alpha = .67; \quad m = 4.25; \quad s = .67$$

Status diversity

Some people in this team have a lot more status than others.
We all have about the same amount of power within this team. *
Everybody in this team is at about the same hierarchical level. *

$$\alpha = .70; \quad m = 3.98; \quad s = .92$$

Task interdependence

The tasks require that everybody in the team communicate about their work.
We need a multiplicity of skills within the team to accomplish our objectives.
The tasks we have to do require expertise in multiple domains.
The tasks we have to do require close coordination between all team members.

The tasks we have to do require a team with a balanced collection of skills.

$\alpha = .81; m = 4.94; s = .90$

Task difficulty

My tasks in this team are quite easy. *

My assignments in this team are very complex.

The tasks we have to do in this team are very complex.

Most of the tasks we have to do in this team are routine tasks. *

$\alpha = .80; m = 4.47; s = .94$

Role ambiguity

Each team member has clear responsibilities within the team. *

It is difficult to know who is responsible for what in our team.

There are clear ways to assign subtasks to the different team members. *

$\alpha = .69; m = 3.75; m = .97$

Goal ambiguity

Our team objectives are clearly stated. *

Our team performance is evaluated against known objective criteria. *

It is not clear what our team is supposed to do.

$$\alpha = .75; \quad m = 3.65; \quad s = 1.13$$

Overall support

Teams are really valued by top management in this company.

This company values teamwork a lot.

What priority is given to this team by top management?

(low/high on 7- point scale)

How would you describe the resources this team receives

from the company? *

(sufficient/insufficient on a 7-point scale)

$$\alpha = .75; \quad m = 4.50; \quad s = .80$$

Intrateam reward structure

The best performers in our team receive extra recognition.

All team members are rewarded equally in this team,

independently of individual contribution. *

$$r = .42; \quad m = 2.99; \quad s = 1.19$$

InterTEAM reward structure

Our team competes directly with other teams for access to resources.

Our team performance is evaluated against that of other teams.

Our team rewards do not depend on how well the other teams are doing. *

$\alpha = .58; m = 2.95; s = .85$

Duality of resources

It is difficult for our team to meet because of our other commitments.

My performance on this team has virtually no effect on my chances for promotion.

We find it hard scheduling meetings together.

Working on this team improves my chances of being promoted. *

$\alpha = .67; m = 4.85; s = .77$

Note: * in this appendix indicates a reversed item.

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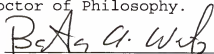
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BIOGRAPHICAL SKETCH

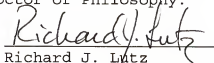
I was born in Valence, a small town in the South of France. After obtaining my baccalaureat degree in mathematics and physics in 1983, I decided to pursue studies that would appeal to both my scientific and literary interests. After two years of hard work and skiing in the city of Annecy, I was lucky to be accepted at the Ecole Superieure des Sciences Economiques et Commerciales (ESSEC), a private business school in the Paris area. I graduated from ESSEC in 1988 with a specialization in marketing and statistics. While at ESSEC, I worked as a research assistant for a marketing professor, Michelle Bergadaa, and got from her the love of research and of marketing. Upon graduation from ESSEC, I decided to work as an independent marketing consultant in Paris to make a living and to continue working as a research assistant in my free time. After two years spent juggling both lives, a doctoral program seemed like a very attractive option. This dissertation is an offspring of my fascination with group processes which originates from experiences in diverse adventures around the world and of

experiences in diverse adventures around the world and of my consulting experiences which convinced me of the importance of organizational factors in strategic marketing.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


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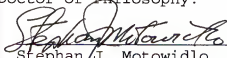
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This dissertation was submitted to the Graduate Faculty of the Department of Marketing in the College of Business Administration and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy

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